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THE AIRLINE INSURANCE INDUSTRY

A FUTURE STUDY

JEANNETTE VAVRIN

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The Airline Insurance Industry--A Future Study

THE AIRLINE INSURANCE INDUSTRY

A FUTURE STUDY

JEANNETTE VAVRIN

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Preface

"For at least six thousand years, to our knowledge, men have persistently and ingeniously sought to foretell the future. The ancient Chinese tried to read their fate by studying cracks in dried turtle-shells. The Babylonians developed the art of astrology, still practiced widely today, even in the most advanced countries. The ancient Greeks visited the oracle of Apollo at Delphi and pondered her ambiguous answers. The Roman augurs examined the entrails of animals and birds in order to determine the future and advise the government. The Christians of medieval Europe relied on the Bible and its interpreters, as well as soothsayers, astrologers and prophets. Even today most of the world's people still rely on one or more of these prescientific methods of predicting the future" (Beckwith, 1967, p. ix).

The interdisciplinary field of future studies has been around since the mid-sixties. It is based on the assumption that events and trends can be systematically examined, leading to various alternative scenarios of what might be. It does not pretend to make exact or even necessarily correct predictions of these events and trends but aims to show possibilities of "what might be" through forecasting and exploring.

In this study I have used expert knowledge to determine the future consequences of some of the variables affecting the insurance industry today with special emphasis on airline insurance. The report is divided into two parts: Part I is on the industry and Part II is on the methodology used for the study. This division is for the convenience of the two main categories of readers--industry and academia.

Warm thanks and appreciation go to those who stuck with me: My advisors (Professor Lars Persson and Professor Solveig Wikström), those companies (Skandia Insurance Company Ltd.'s International Marine and Aviation Division and Hansa International Insurance Company Ltd. [of the Trygg-Hansa Group]) and the Swedish Institute supplying me with funding, the many companies supplying me with information, and especially to my colleagues in

the Department of Business Administration at Stockholms University.

I am interested in the readers reactions and can be reached at

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Dallas, Texas 75229
USA.

Stockholm, 28 August 1980

Jeannette Vavrin

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Part I

The Airline Insurance Industry

1. Introduction

By way of introduction this chapter presents to the reader my objective and justification in doing this study, my research problem and the approach I have selected to solve it.

1.1 Background of the study.

Today the airline insurance industry is faced with over-capacity and declining premium rates. Business has been increasing but profits have been declining for the insurance industry as a whole and particularly for the airline sector.[1] This situation has prevailed for some time and it is difficult to predict any changes in the market and when these changes can be expected to occur. This study will identify and describe some of the internal and external changes affecting the airline insurance industry currently and make projections of their consequences to the year 1990, by creating scenarios of alternative possibilities. These scenarios could then be used as an aid in short- and long-range planning for management in the industry.

This study will confine itself to the airline insurance sector--namely, operators of scheduled airlines--and exclude general aviation, military, space and satellites.

I have always been interested in aviation and wanted an international complex industry having a lengthy stretch of problems (i.e., insurance industry) for doing a future study. A Paris reinsurer suggested, "Why not put the two together?" Good idea!

As one unsuccessful insurer confessed to me after a very lengthy discussion on, for instance, the subject of "how to determine premium rates": "In the final analysis none of the variables just mentioned really matter.

---

[1] See Chapter 2 of this report for a detailed discussion of some of the current conditions affecting the industry.

It is still up to me to come up with a premium rate." "Fine," I said, "How do you do that?" "I look out the window...." Maybe I can add a piece of another dimension to his window!

1.2 Aim of the study.

The aim of this study is to identify and describe some of the internal and external changes affecting the airline insurance industry currently and to make projections of their consequences to the year 1990.

By identifying the changes affecting the current conditions in the industry and the airline insurance sector specifically and the consequences of their changes over time, management can be helped in their planning over and for the future years.

As environmental variables affect all industries universially, an example from the insurance industry of a complex international industry would be meaningful to show environmental changes and their consequences over time to a wide range of readers. This analysis, though specifically centered on airline insurance, could be used by business planners to better understand the role of the environmental factors affecting their decisions. In an unstable market or environment, available or possible options must be identified and analyzed in order to make the best decisions.

1.3 Research problem.

My research problem is to determine how best to identify what changes are influencing the conditions in the industry today and how these influences will affect changes in the future and what the consequences of these influences will be. To determine what these influences are I will describe and explain some of the conditions existing in the industry and to show how much can be explained by external variables (and what they are), and how much by internal actions and reactions.

Therefore, the emphasis of this study will be on the external and internal influences, to explain, forecast or foresee future conditions or prerequisites for the airline insurance industry to enable management to make plans in the current uncertain environment rather than just buying options. This assumes the future can be improved by active intervention

in the present.

Figure 1 shows the structure of the required analysis for this study.

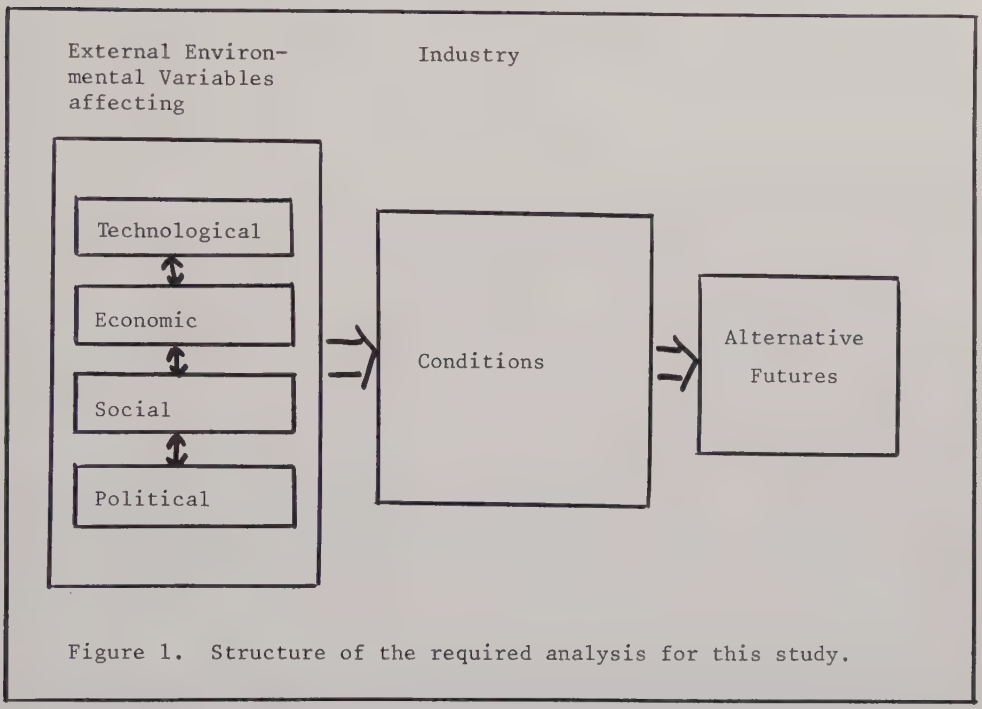

Figure 1. Structure of the required analysis for this study.

1.4 Complementary ways of dealing with the future.

To be able to guide or steer a system you must have knowledge about that system. The question is to make decisions at the right time and with the proper surrounding information. Sufficient background material is needed to choose the proper time perspectives to meet the problem's needs.

There are alternative or complementary ways of dealing with the future. Some approaches are more appropriate to a short-range time horizon, others when you have a long-range time horizon. For the "in between" time problems, the choice of methods depends very much on the kind of problem.

Though both planning and future studies are future-oriented, planning usually has a relatively short time span (for example, up to 10 years), whereas future studies are concerned with the long-term, typically ranging from 10 to 50 years and sometimes longer. The time span for this study is

from 1978 to 1990.

The tendency for planning to view the future on the basis of quantitative changes necessarily reduces the number of variables and alternatives to which planning may address itself. Future studies, on the other hand, looks at a number of possible futures and attempts to explore environmental variables in order to assess their impact on whatever system is being considered.

The techniques and methods used further distinguish planning and future studies. The methods appropriate for planning are data-based, emphasizing analytical and quantitative methods.

On the other hand, future studies' base line is in the future, where there is no hard data. Though future studies take into account information available on existing trends and developments, their use is on forecasting alternatives and not on making a precise prediction.

The typical methods of future studies, all of which are based essentially on expert knowledge, are: Scenario writing, Delphi technique, cross-impact matrix, morphological analysis, similation and gaming, to name a few.

Though future studies would use some of the techniques of planning, they also require artists, philosophers, and writers, particularly of science fiction.

The difference between planning and future studies are fuzzy. A clear distinction between the two does not exist. Systematic analysis could be used to identify current conditions in the industry (i.e., a usual planning approach) whereas creative synthesis could be used to identify changes in the variables affecting these current conditions over time and the consequences of these changes (i.e., a usual future studies approach).

All studies and their potential are open to criticism. Planning, like future studies, does not deal with all aspects of the future, but both are ways of presenting alternatives--whether short-term or long-term, respectively. Since decision making is forward looking and decisions made in the present are intended to achieve results in the future, decision makers must address themselves to a particular image of the future. Most organizational decisions are made on the assumption that the future will be similar to the present or that past trends will continue in the future. Future studies allows for a multi-faceted view of the future.

1.5 Research approach to this study.

As stated earlier this study will identify and describe some of the internal and external changes affecting the airline insurance industry currently and to make projections of their consequences to the year 1990, by creating scenarios of alternative possibilities. A systematic analysis of the current conditions in the industry and the variables affecting these conditions would basically be what planning is concerned with. A creative synthesis of changes in the variables affecting these current conditions over time and the consequences of these changes would be what future studies are concerned with. Both planning and future studies are ways of identifying alternatives--whether short-term or long-term, respectively.

My research approach is to use a modified Delphi approach (sequential face-to-face interviews rather than written questionnaires in a series of four rounds which can be seen in Figure 2) of questioning experts in the industry about what is going on in the industry and to determine what are the underlying factors behind these occurrences. I am using industry experts as I want to know what the industry thinks and how they think. I will use a future studies approach as a way of thinking and formulating my research. (See Chapter 4 for a detailed description of future studies.)

Identifying the current conditions in the industry is the base for creating the future scenarios. Therefore the results are divided into two parts: (1) Chapter 2--Background of the study--which gives an overview of an analysis of the insurance industry in general and the airline insurance sector in particular from different points of view. In this way, I have tried to show what is important in the industry and to this study. I have also constructed a frame of reference of the industry which shows how the different areas are related to each other and, in turn, to the environment (see Figure 1).

And (2) the other part of the results is presented in Chapter 3--The results of the study--which presents a synthesis over time of the variables affecting the current conditions and their consequences in the industry. Alternative scenarios of 1990 are presented.

(Note: I hope the reader will not be confused by my calling this a future study. I am using planning to work in the now (short-term) and future studies to work in the future (long-term). I consider future studies a form of planning even though it may not be as structured or as systema-

tically executed as short-term planning normally would be executed. The qualitative and intuitive methods usually associated with future studies could just as easily be associated with planning. For convenience's sake I call this a future study but it could just as easily be a rather creative planning study. A forecast would be made either way even though the person doing the study may not share access to means of influencing the future studied.)

I might also add, in this study there are two kinds of methodological problems: (1) concerns the choice of method to forecast the developments of the real system, and (2) the other concerns the analysis of the forecast to show mutual dependencies and affects for the various problems of the

Figure 2. Research approach to this study.

Step	Goal	Method	Output	Analysis
Step 1 or Round 1 (pre-study) (current)	Identify problems (current)	Modified Delphi approach	Interview responses	Intuition and through use of secondary data and literature sources
Step 2 or Round 2 (current)	Check problem areas and identify affecting variables (current)	Modified Delphi approach	Changed interview responses; affecting variables; new areas	Synthesis of problems and affecting variables
Step 3 or Round 3 (current)	Recheck problem areas and affecting variables	Modified Delphi approach	Changes	Final format for analysis (current) and structure for future (1990)
Step 4 or Round 4 (future)	Follow through affecting variables and problem areas (1990)	Modified Delphi approach and scenarios	Changes	Alternative scenarios

study. This will give a proof of consistency of the forecast. (These are discussed in greater depth in Chapter 4 of this report.)

How to set up the forecast takes up a large part of a future study. The forecaster sometimes gives a probability of how sure he is that the forecast will happen. In this study, I won't be assessing probabilities. I might further add, that what I am doing in this study is looking at whole pictures which differs from traditional forecasting which aims to develop a few specific factors.

The aim of a future study is to systematically and/or creatively investigate what might happen in an area under different conditions. With this aim I seek through my analysis to make up a number of forecasts on the different parts of the questions concerned. The results of a future study therefore are to show a future made up of a number of alternative development sequences. These will be dependent upon the conditions which apply to each development. A future study can therefore be said to be a map over what can happen--a map of threats and possibilities. What really happens will depend on which choices are made among the given possibilities and the underlying conditions affecting their development.

Each forecast is built upon the performance of a model showing which factors influence/decide the value of the forecast variable in question. These can be quantitative or qualitative models formulated in prose or mathematical terms. They can be more or less specified. A more specified model is not always to be preferred.

The problem in doing a good forecast is to choose a forecasting model and, secondly, to choose a method of obtaining data (information) and then fit that information into the model. A less specified model, however, often leaves considerable room for judgment by the forecaster.

In Figure 1, I presented some factors influencing the insurance system. By the addition of time this figure can be used as a frame of reference for the formulation of a very coarse forecasting map and is the conceptual model I am using for this study.

Another problem with the forecasting process has been with the large quantity of variables in the forecast and the wide field they involve. (As one colleague of mine has stated, "The external environmental variables of Technology, Economics, Society, and Politics are too complex to handle taken one by one; together they almost become the whole world!") To build a proper picture of the insurance industry, the forecast will use existing

trends as well as new happenings and break throughs. The over-simplified and rather unspecified forecasting model has been applied to all variables but mainly to show relationships. A more detailed model would have been too complex and therefore too difficult to handle.

The second stage in the forecasting process has been to choose methods to get data and to put it in the overall model on the different variables. For this I have used a modified Delphi approach which I have already mentioned. Figure 2 presents the stages of my study, the goal for each stage, the method used for obtaining data, what the output was, and how it was analyzed.

I chose a modified Delphi technique for data collection as I wanted to go back to the key decision makers in the various centers in several rounds:

- To identify the problems (current),
- To check the problem areas (current),
- To identify the affecting variables (current),
- To recheck problem areas and affecting variables (current), and
- To follow through the problem areas and affecting variables to 1990 and 2000 (future).

The application of the Delphi technique, in principle, leaves the interpretation of the model and data input to the experts. Though the prestudy began with a select number of face-to-face interviews and expanded to mailed questionnaires and telephone interviews, the two latter methods proved most unsatisfactory from the standpoint of time and efficiency and just getting the experts to talk. Stages 2, 3, and 4 were conducted as face-to-face interviews. As <u>each</u> expert's judgment is something of a "black box," to counteract this uncertainty in each individual estimation, a number of experts (i.e., a panel) was used.

As the majority of the data input to this study has been done according to my modified Delphi approach (though supplemented with secondary data and literature on the industry where possible), I will discuss how the process can influence the forecasting outcome compared with other forecasting methods. (Chapter 5 of this study will critique the methodology used and show some of the problems encountered when using Delphi, so this will not be done in depth here.)

I am only concerned with those forecasting methods which generate new information rather than analytical methods which systematically treat the

consequences of existing forecasts.

Forecasting methods which generate new information can be broken down into trend and intuitive methods. Trend methods include trend curves of different kinds of coordination and analogy analysis. These methods look at a relatively bounded number of influencing variables. They are built upon explicit models that can be formulated in mathematical terms. The coordinates as given in the models often are based on statistical analysis of historical material.

The group of intuitive and speculative methods contain methods based on real guesswork such as utopia creation and science fiction but also underlying experts' judgments as in Delphi, which is an intuitive method.

In practice there is not such a clear distinction between trend and intuitive methods. Judgments usually have a starting point of a systematic analysis of the underlying variables and consideration is given to certain qualitative variables' influences in both types of methods.

It should be asked at this point how reliable is the data (i.e., would an extension of the study give the same results and would the same method give the same forecast if the process was repeated)? With semi-formalized methods reliability is poor. In this method of judgment or estimation of the influences of variables that are not precise or quantified, it stands to reason that such techniques can give different results if the forecast process is repeated. Likewise, different persons at the same time can come up with different results and the same person with different results in different time frames.

In a normal Delphi-forecast, the value of the forecast is decided by the experts' groups median value. Each of the experts gives an estimation on similar events together which are made in the same formalized forecast. The Delphi expert probably doesn't base his estimate on an explicit estimation. It is therefore difficult to derive the eventual variations in the individual judgments or estimates.

I don't think the median value presents an accurate picture whether you are looking at the future or the present. It would assume the same degree of knowledge and the same thought processes by each of the experts and this is certainly not the case even for coming up with a picture of the present. One could state a counter-hypothesis: Whatever will be forecasted by expert groups in 20 years from time 0, the future will <u>not</u> be in the groups' median value but at an extreme.

Validity of a future study might be thought of in terms of how well it predicts future developments. But even more important, may be the way in which it influences today's decisions. Good criteria of validity are, however, difficult to set up.

With respect to the somewhat vague concept of validity, a formalized forecast looks like something is missing in it. Such techniques consider only a bounded number of factors and only those which can be stated in quantitative terms. The semi-formalized forecasting methods have the possibility of considering a larger range of factors--quantitative as well as qualitiative. But something will be missing from them, too.

The value of the information will be dependent upon (1) how systematic the analysis is in the forecasting process, and (2) how knowledgable the forecaster is about the influence of non-quantifiable factors.

With Delphi, the semi-formalized methods' positive side comes out. A well-composed panel, questioned in several rounds between which information is fed back, has a more exhaustive consideration of all relevant factors than what is possible with all other forecasting methods.

Semi-formalized techniques leave a wide range for evaluation as estimations in the forecasting process can be influenced by the forecaster's conscious wishes, preferences, etc.

The Delphi method is criticized by the room it gives for the individual evaluations. The evaluations play a role on different levels in the forecasting process. The one who leads the expert questionings can influence the results through the way the questions are formulated and how the answers are edited. The processing will be in rounds--so the questioner's contribution will be greater than in ordinary questionnaire's research with open questions.

An important point which hasn't come out so far in the evaluation--is the role of creativity (which was only alluded to earlier)--which plays a large part in complex forecasts. Creativity determines how the forecast will be broken into developments, new happenings, trends, etc. Intuitive methods, Delphi included, can solve this type of forecasting problem which more formalized methods can't master.

The strength of an intuitive approach lies in its power to consider a large range of factors--quantitative as well as qualitative. This is the intuitive method's superiority over the formalized. The main reason for

using a modified Delphi approach (modified in the sense that questions were asked rather than written in face-to-face rounds) was that a large part of what I wanted to identify and then to forecast was too complex to come to grips with in any other way. There were other considerations--it's relative inexpensiveness to execute, it's being easily communicated, and it's fitting in with my own background and temperment were the main reasons for choosing this method.

As mentioned earlier this study has two methodological problems. The first concerning the choice of method to forecast was just discussed. The second concerns the analysis and presentation of the forecast. I am using scenarios to analyze my findings and to present my results.

Scenario technique will be used for the analysis of the data (from key decision makers in the industry, my own thinking, and input from other sources) and for the presentation of the results. The current scenario is built upon Chapter 2 which describes the conditions underlying the performance of the insurance industry today. The results of this study (Chapter 3) present a hypothetical sequence of events in the industry focusing on main decision points.

Scenarios are alternative descriptions of what situations might look like in the future. These descriptions cannot give all of the details and dynamics possible so stress certain points of view (even if chosen arbitrarily) of whole pictures (for instance) vs. the development of a few individual factors. The emphasis is not on exact predictions of what might be but as a guide post to the future.

Scenarios can be used for planning, as an aid to decision makers for planning, as a warning device (i.e., if it is found a certain negative development might occur, to take steps to avoid it) and as a method of analysis of thinking about (or feeling out might be a better way of putting it) the future by going from the parts to the whole.

Scenarios are usually built on or performed in an explicit-time frame --a time model is used to develop knowledge. The process of writing scenarios is to start with a few factors upon which new ones develop. They are affected by outside information (exogeneous developments) and by information within the scenario (endogeneous developments). This is done by sketching a paradigm of explicitly structured assumptions, definitions, typologies, conjectures, analyses, and questions and then conctructing a number of explicitly "alternative futures" which might come into being under stated conditions--an explication of possibilities.

Chapter 5 of this report will present my use of scenarios as a method of analysis and as a method for presenting the results of the study in further detail.

1.6 How to read this report.

The report is divided into two parts for the convenience of the two main categories of readers: Industry and academia. Part I is on the insurance industry and Part II is on the methodology pertaining to the study. Part I includes Chapters 1-3 and Part II includes Chapters 4-6.

Chapter 1 consists of the aim of the study (to identify and describe key changes afffecting the current conditions in the industry and what changes there might be over time in these areas); my research problem (to determine how best to identify what the changes will be); and my research approach (to use a modified Delphi approach of questioning experts in the industry about what is going on in the industry and as to what are the underlying factors behind these occurrences--data collection--and the use of scenarios for data analysis and presentation of the results). A future studies approach is used as a way of thinking and formulating my research.

Chapter 2 starts with a background to some of the general problems facing the world-wide insurance industry, then proceeds to the airline insurance sector to look at these same problems. (A glossary of terms particular to this study is attached in Appendix II.)

Chapter 3 gives the results of the study presented in two alternative 1990 scenarios.

Chapter 4 gives a general discussion of future studies.

Chapter 5 discusses my research approach to the study in terms of the central problem areas in carrying out the study: Identifying the problem, choosing the forecasting model, gathering the data, analyzing the data, and transferring the data into scenarios. General critique of what I have done is also in this chapter.

Chapter 6 summarizes the report: It's usefulness, general conclusions and further areas for research.

Appendix I consists of the cover letter and proposal mailed to the industry in October 1978. Appendix II is the glossary mentioned above. They are followed by the bibliography.

2. Background to the Industry

2.1 Introduction.

This chapter starts with a background to some of the general conditions existing in the world-wide insurance industry today (Section 2.2) as a context for looking at conditions in the airline insurance sector (Section 2.3). These two sections are followed by a third section (Section 2.4) which uses theoretical literature to aid in interpreting the data on the industry.

Therefore this chapter gives an overview of an analysis of the insurance industry in general and the airline insurance sector in particular from different points of view. In this way, I have tried to show which parts are important in the industry and to this study.

Identifying general conditions existing in the world-wide insurance industry was the starting point for this study, so that the reader can see that those conditions, specific to the airline insurance sector, are not unique but part of a trend affecting the industry at large. Input to Sections 2.2 and 2.3 are based on interviews and secondary literature on the industry.

The main problem has been to identify just what are the problems. de Bono states (1969, p. 228) that "a problem is simply the difference between what one has and what one wants." He further states that there are three basic types of problems (1969, pp. 228-229):

1. Problems that require the processing of available information or the collection of more information.
2. The problem of no problem--where the acceptance of an adequate state of affairs precludes consideration of a change to a better state.
3. Problems that are solved by a restructuring of the information that has already been processed into a pattern.

The first type of problem can be tackled with logical thinking or mathematical thinking or the collection of more information. The second

and third types require lateral thinking. "With the other types of thinking you know what you are looking for. With lateral thinking you may not know what you are looking for until after you have found it" (de Bono, 1969, p. 230). With vertical thinking (natural, logical and mathematical) "one moves only if there is a direction in which to move. With lateral thinking one moves in order to generate a direction" (de Bono, 1969, p. 230).

This can be done in two ways: (1) To counteract, restrain or delay the fierce selective processes of the memory surface itself, and (2) To bring about deliberate arrangements and juxtapositions of information that might never otherwise have occurred. "The aim of both of these processes is to allow information to arrange itself in new and better patterns as happens in insight" (de Bono, 1969, p. 230). And this is what I am trying to do with this study.

In trying to identify what the problems facing the industry are, I have relied on the key decision makers' perceptions of what their problems are. That there is more business but less profit seemed to be on the lips of everyone. At least the insurers are convinced this is true.

As my mailing to the industry occurred October 1 (see Chapter 5 for further details), just two weeks after Anatole Kaletsky's article appeared in The Economist: "Hazards Ahead: A Survey of World Insurance", September 16, 1978, I received dozens of copies of this article from world-wide insurers who thought it was the answer to all of my questions. It just confirmed symptoms that had already been brought to my attention during interviews in July and August of 1978.

Therefore, Section 2.2 briefly describes some of the conditions existing in the insurance industry today. This will be the starting point for looking at the conditions existing in airline insurance (Section 2.3).

My approach to analyzing the information in both sections and to developing the current scenario (found in Chapter 3, Section 3.4) will be to go through the four steps as shown in Table 1--The method of determining the state of the art.

This could be compared to a hermeneutic approach that "seeks to formulate interpretations that enhance 'understanding', rather than to develop 'laws' that 'explain' phenomena" (Gouldner, 1975, p. 336).

By analyzing the current state of the industry in this way, I will be able to identify some of the external and internal variables affecting the

Table 1.	Method of determining state of the art.
Step 1.	Present what was found out about the industry from the interviews and from secondary literature sources.
Step 2.	My interpretation of the findings.
Step 3.	Comparison of some of the findings with theoretical models where possible.
Step 4.	Final interpretation of the findings

industry currently. This will be the starting point for Chapter 3 which presents the alternative future scenarios for the industry to show some of the possibilities as to what changes will occur in the industry, when they might occur, and what the consequences of these changes will be.

2.2 Conditions affecting the world-wide insurance industry.

There has been more business but less profit in the world-wide insurance industry over the past few years.[2] Large industrials and airlines tempted by cheaper rates and their own management pressures are taking their business outside of the established insurance centers, such as London.

For example, aviation insurance rates have been falling steadily since 1973 until they are so low today that one airline manager of insurance confided jokingly, "The day will come when insurers will pay us just to have our business!"[3]

Insurance has always been a highly cyclical business, with good and lean years alternating on a regular basis every 6 to 8 years anyway. There is always a time lag of at least two years between a change in rates and the emergence of the underwriting results which the new rates have pro-

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[2] Interviews with insurance and airline industries, July-August, 1978; also stated in Anatole Kaletsky's "Hazards Ahead: A Survey of World Insurance," The Economist, September 16, 1978, pp. 3-11.

[3] Comment made by insurance manager of a leading European airline, October, 1978.

duced. "The current underwriting cycle, particularly, in Europe, is acting differently than expected--despite underwriting losses, new competitors are pouring into markets like Holland, West Germany and even Britain" (Kaletsky, 1978, p. 3). The insurers state the usual signals (i.e., cut-throat rates equals low profits, yet still more new comers enter the market) are being ignored. And the insurers don't know why (i.e., speculation that is due to a false-sense of optimism at the recovery of the economy).[4]

"Insurers recognize that when motor insurance becomes a major item in the cost of living, as it already has in many countries, governments will inevitably be tempted to interfere with its pricing, especially as compulsory insurance laws in some countries encourage the public to think of motor insurance as a kind of indirect tax" (Kaletsky, 1978, p. 4).

"Even so, the fastest growing, but riskiest, new types of insurance such as product liability, pollution insurance or insurance for vast concentrations of risk, such as oil platforms, are being shunned by many insurers" (Kaletsky, 1978, p. 4). Insurers are seeking conventional business (i.e., factories, fire, etc.)

Another change in the industry is that insurance is becoming more of an international business. Insurers look abroad in an attempt to spread their risks and to find the profitable business that their own countries cannot provide. "Insurers all over the world, all reacting in the same way, are colliding head-on in the limited markets they are simultaneously trying to develop" (Kaletsky, 1978, p. 4).

"To make matters worse, some of the business they are seeking is vanishing" (Kaletsky, 1978, p. 4). For instance, usual clients--multinationals are self-insuring many of their smaller risks and forming "captive" insurance companies (companies which enable them to set aside reserves for big losses, improve their assessment of the risks involved and save insurance premiums which many of them believe to be excessively high). Also, "developing countries, which offer the best opportunities to broaden the geographical spread of risks, are closing their doors to foreign insurers by setting up local, and often state-owned, insurance companies to look after their own insurance needs" (Kaletsky, 1978, p. 4).

At the same time, the international insurance brokers are searching the world looking for funds to insure the really big risks, such as oil plat-

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[4] Interviews with insurers, July-August, 1978.

forms, underwater pipelines, nuclear plants, etc. Contradictorily, "the international insurance market, over-flowing with capacity to write the smaller conventional risks [i.e., airplanes], still lacks the money (and possibly the nerve) to insure some of these vast installations" (Kaletsky, 1978, p. 4).

"By organizing national insurance companies, captive companies, and new sources of insurance capacity, such as life insurance companies and wealthy Arabs, into insurance pools, the brokers are spreading the smaller risks so wide and thin that adverse insurance results are hardly likely to make an appreciable impact on insurance rates for some years ..." (Kaletsky, 1978, p. 4). This could be an example and explanation for why the usual signals as to a poor market performance are being ignored as mentioned earlier.

"Investment income has produced the bulk of insurance companies' profits since before the second world war" (Kaletsky, 1978, p. 11). But whatever happens to the insurance side of an insurance company, the insurance company's investment income will continue to rise. "Though insurance profits will be harder to achieve because of competition, they will have less impact on an insurance company's results, simply because investment profits will be so vast" (Kaletsky, 1978, p. 12).

"As the markets become more competitive, so insurance companies in western Europe, the US, and Japan which had been content earlier simply to underwrite domestic business, have begun to spread their wings--and their risks--beyond their national frontiers" (Kaletsky, 1978, p. 15). One reason is to hold onto the domestic industrials who have become multi-nationals. But, of course, they are not limited just to those companies and try to get anything they can in a very competitive market.

"The forces pushing [or pulling, rather] insurers into new and unfamiliar markets have operated largely through the reinsurance market. Reinsurance is rapidly becoming the key in the development of insurance all over the world" (Kaletsky, 1978, p. 23) but only involves professional insurers or brokers so it is not so well known.

Reinsurance has two main purposes: "to spread out individual risks that are too big even for the largest direct insurers to bear alone; and to allow small insurance companies to accept more business than their own capital could safely support.... Most reinsurance is arranged through treaties, under which the whole of the direct insurer's business of a certain category (i.e., fire insurance in Australia) is reinsured for a year.

Having signed the treaty, the reinsurer has no further influence over the direct insurer's underwriting decisions" (Kaletsky, 1978, p. 23). (Though, of course, there are certain "ethical constraints" which if surpassed would make it difficult to renew the treaty.)

"The reinsurer has to pay up on any risk that the direct insurer decides to accept during the year.... If the direct insurer finds a risk he wants to insure, the reinsurer automatically gets a slice of the action, without making any further effort himself" (Kaletsky, 1978, p. 23).

"The advantages of treaty reinsurance are that it reduces the reinsurer's expenses to a mimimum and guarantees him a steady flow of premium income, without the need to build up an expensive marketing force or even, in some cases, without employing a team of specialist underwriters. [But] ... the inexperienced reinsurer, who knows little about the conditions in a particular national market, can be easily a dupe for direct insurers who want to drum up business by cutting rates, passing on most of their risks to the reinsurer but profiting from large and effectively risk-free commissions" (Kaletsky, 1978, p. 23) from the reinsurer. The alternative would be to arrange reinsurance by facultative agreements in which the reinsurer examines and individually rates every risk.

"Reinsurance enables any insurer to move into new markets all over the world simply by flying out to see the direct insurers in these markets, with some treaties in his briefcase. The reinsurer avoids much of the detailed regulations that most governments impose on direct insurers operating in their countries. He can [also] provide much needed capacity to direct insurers in developing countries" (Kaletsky, 1978, p. 23). There is a surplus, though of reinsurance in northern Europe and West Germany, it might be interesting to note.

With new insurance companies entering the market, established insurers are reluctant to lose business, even if that means cutting rates to keep it. If rates fall too low, direct insurers simply take out more reinsurance to cover themselves. Brokers and new competitors are taking advantage of the insurer's determination to hold onto their business at all costs.[5]

US and European insurers are turning their attention to the developing countries of the third world. "The developing countries cannot keep their insurance all at home for several reasons: lack of capital, lack of exper-

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[5] Interviews, July, 1978 to January, 1979; also, Kaletsky, 1978.

tise, excessive concentrations of risks in their cities and large industrial plants, and because of the relative lack of small consumer risks. [This makes for an unbalanced nature of their insurance needs.] The obvious solution to their dilemma is for them to make arrangements with insurers and reinsurers abroad that can be tailored to their specific needs" (Kaletsky, 1978, p. 32). It is in the development of new insurance products that the future of insurance lies.

London is still the center of the insurance world according to London, but also recognized by most insurance markets. But in reality London is simply becoming one of many insurance centers. Paris, Stockholm, New York, Zurich, etc. are also emerging as insurance centers. "The development of new insurance lines, the world-wide ambitions of previously insular insurers in Europe and the US, fluctuations in the world's currencies and the growing significance of reinsurance" (Kaletsky, 1978, p. 36)--all these are challenges to an established center such as London and even to established insurers.

2.3 Conditions affecting the airline insurance sector.[6]

Since the end of World War II, the aircraft industry has developed rapidly, and the insurance industry has followed suit.

Why is aviation insurance important? As aircraft have developed from speeds of 60 m.p.h. to an estimated 1800 m.p.h. (with the supersonics) together with ever increasing costs that air operators, manufacturers and financial enterprises are investing in the aircraft industry that each and every company cannot afford to lose the whole, or even a part, of their capital as a result of accident or misfortune. It is for this reason aviation insurance enterprises have been formed.

The following shows the post-World War II technical developments of aircraft:

1946-1950. Conversion of war transports with multi-pistoned engines.

1950-1959. Specially developed piston-engined aircraft with pressurized cabins (i.e., DC-7, Constellation, Strato-cruiser).

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[6] Input to this section comes basically from interviews from October 1978 to Janaury 1979 and from sources, where quoted, called to my attention during these interviews.

1956-present day. Development of turbo-props making aircraft more reliable, fuel econonomical and fast. Initially for long-distance but over taken by the "pure" jets (see below) (i.e., Britannia, Electra, YS11, HS748).

1959-1969. "First generation" jets suitable for long-distance flights (i.e., Boeing 707, DC-8, Comet IV, VC10, Convair 990).

1964-present day. "Second generation" jets--development of the fan jet engine; more economical at lower altitudes (i.e., Boeing 727, Boeing 737, DC-9, BAC1-11).

1969-present day. "Wide-bodied" jets--development of greater passenger carrying ability per unit (i.e., Boeing 747 [450+ passengers]; DC-10, Lockheed Tristar [350+ passengers]; A300B Airbus [280+ passengers].

The history of aviation insurance is linked quite closely and quite naturally to the development of civil aviation. A year or so before World War I insurance "had been issued for 'crash' and third party liability risks associated with this then new and exciting form of locomotion" (CII, 1975, p. 1/1). But "the real history of aviation insurance dates back to 1919, due to the efforts of some syndicates of Lloyd's[7] together with the Union of Canton. These aviation risks were transacted through the White Cross Insurance Agency.... [But] aviation insurance business deteriorated in 1923, when underwriters met heavy claims. This was attributed mainly to rate cuts when other Lloyd's syndicates entered the field" (El Din, 1971, p. 9). In 1931 the B.A.I.C. (British Aviation Insurance Company) was formed with capital from seven large British insurance companies and grew rapidly. "This rapid expansion was due to the fact that B.A.I.C. was able to constitute pools, where a number of assoicated companies received shares of the aviation risks written" (El Din, 1971, p. 9). And as early as 1935 the Lloyd's Aviation Underwriters' Association (L.A.U.A.) had been formed (CII, 1975, p. 1/3).

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[7] Lloyd's is an institution with a large number of underwriting members in London. Each member is personally responsible for the obligations that he undertakes, although underwriters are usually grouped into syndicates for convenience of operations (CII, 1975, p. 1/3). (Note: There are 39 syndicates in aviation at Lloyd's [137 in marine, 148 in non-life, 43 in motor, and 10 short-term life and have over 14,000 underwriting members between them] as stated in Lloyd's Nautical Yearbook 1979. This yearbook further states, that the first aviation insurance was accepted at Lloyd's in 1911, and the aviation market today has an annual income in excess of £100 million at Lloyd's.)

In the US where aviation grew rapidly "with a coast-to-coast run of 3000 miles under one Federal Administration, the development of an airline is very much simpler than in Europe where civil aviation is constantly retarded owing to nationalistic routes to observe certain corridors of entry" (CII, 1975, p. 1/3). The US insurance development has been largely handled by two groups: The United States Aviation Insurance Group formed in 1928 and followed by the Associated Aviation Underwriters. The "U.S.A.I.G. member and associate member companies include just over sixty of the United States' insurance companies" (El Din, 1971, p. 11). It is also one of the few organizations to operate continuously since it was founded.

"In 1945, experienced American underwriters of the old-established groups [above] sounded a note of warning as to the probable effect of unrestricted competition. ...if one gave too much support to the wrong newcomer or even to certain established persons, the entire domestic market for that particular class of risk could easily be undermined" (CII, 1975, pp. 1/4-1/5).

Other aviation insurance markets (i.e., centers) which have started to write aviation insurance very early are:

In Scandinavia, the Nordic Pool of Aviation Insurance was founded in 1919 and was composed of 80 companies; in 1969 it had a membership of 121 companies (El Din, 1971, p. 11). Skandia's International Aviation Department is another major factor in the market.

In France there are two principal pools Aerofrancasur (leading Air France), and the Malatier Group (leading UTA/Air Afrique) and Aviafrance (El Din, 1971, pp. 11-12).

In Germany, a German aviation pool was formed in 1920 but in 1929 was involved in a heavy crisis following the world-wide depression which badly affected them. But in 1933 demand for insurance increased. At the time of the outbreak of World War II there were 56 members but the pool ceased to operate during the war. The pool was re-established in 1950 but not until 1955 when Germany regained its sovereignty were all restrictions removed on aviation traffic. By 1970 there were 83 members. (El Din, 1971, p. 12)

Aviation insurance is also closely linked to other insurance departments: Marine insurance and to accident insurance and is sometimes handled through these departments in a company rather than through a separate aviation insurance company or branch. The methods used in aviation involve

practices developed from older brances. Legal liability and personal accident follow closely accident insurance.

Switzerland's Swiss Re is one of the largest reinsurers in the world along with Germany's Munich Re. Both have considerable shares in their respective countries' insurance pools.

Japan started in 1973-74 and has very aggressively gone after US premiums, West German premiums, and Japanese premiums as part of their internationalization effort. The plan is to follow Japanese businesses abroad.

Therefore the supply side of airline insurance (the sellers) includes the following centers: London handling approximately 40% of the world-wide aviation business with the remaining 60% of the world-wide aviation business being handled by the US, Scandinavia, France, Germany, Switzerland, and Japan.

It is very difficult to determine how many companies exactly handle aviation insurance. According to guesstimates from interviews the following picture emerges (I am counting "pools" basically as one unit and only list majors in the field as discussed in interviews.): (1) London is made up of 39 aviation syndicates in Lloyd's with approximately 75-100 members, the Aviation Insurance Office Association has approximately 30 companies handling aviation and the remaining companies handling aviation in London would be around 10. (2) The US has 29, Scandinavia has 22, France has 12, Germany 9, Switzerland has 3, Japan has 5 and the remainder of the world has 49. These figires are very inexact--Scandinavia, for example, really has two majors--the Nordic Pool and Skandia's International Aviation Department. Still, I think it gives a picture of the heavy concentration of aviation insurance in London vs. the rest of the world. Reinsurers, due to their potentially small size, number in the many hundreds--they would not show up exclusively for aviation insurance.

Aviation insurance undergoes constant change and generally frequent innovations. With each change there arises the possibility of some unknown or unsuspected risk. As aircraft grow in size, sophistication and passenger carrying capacity, there are unique problems for the insurance industry of absorbing and spreading the catastrophic risks which exist. Aviation claims, etc., never have time to stagnate. New thinking is always needed. (Note: A possible or even probably change for the future could be much more stable conditions.)

In the main, the upsurge in aviation insurance business is due to the

ever increasing cost of a modern, large aircraft coupled with the enhanced limits of passenger liability--the latter is a direct result of the increased passenger-capacity of modern aircraft.

It is difficult to describe this by statistical data as "nobody in the insurance market is, of course, under any obligation to collect industry-wide figures or to make them publicly available; indeed, very few people in the market seem to bother to keep track of what is going on anyway" (Brise and Nordström, 1979, p. 251). But I still want to give a few general facts which will give the reader a brief historical perspective and a rough impression of size.

The demand side of airline insurance (the buyers) would be the airlines mainly. The number of major airlines in the world is approximately as follows (Boeing, "Dimensions of Airline Growth, March, 1978, pp. 14-15):

41	US and Canada
73	Europe
34	Central and South America
36	Near East and Africa
36	Australia, New Zealand and the Far East
220	Total

(As my study is only concerned with airline insurance, I am not considering small commuter services. Same with the number of insurers--the number above reflects those handling the larger commercial airlines and not general aviation, etc. The above figures do not include air taxi services or helicopter carriers. The World Airline Directory published by FLIGHT International, April 22, 1978 has over 620 entries. They "are almost exclusively those [airlines] which operate aircraft of Nord 262/Douglas DC-3 size or above, or Sikorsky S-61N and above in the case of helicopter companies. The few exceptions are certain national carriers equipped with smaller aircraft such as the Twin Otter and Trislander" [p. 1121].)

The number of planes varies but if we look at the world commercial jet airplane deliveries for 1958-1977 (1958 being the start of the jet age) and their values, there are a total of 5950 jets delivered with a value of $47,881 million (Boeing, "Dimensions of Airline Growth," March, 1978, p. 46). This can be seen in Table 2.

To give some idea of the relationship between total number of aircraft and jets I've included the figures for 1965-1969 from El Din (1971, p. 76) on the next page.

Year	Number of Aircraft	Number of jets in service[8]
1965	5630	1370
1966	5831	1687
1967	6214	2214
1968	6771	2932
1969	7134	3472

Table 2. Jet airplane deliveries and values.

Year	Jet Airplane Deliveries No. of units	Value (Current $ millions)
1958	48	132
1959	134	536
1960	256	1223
1961	209	914
1962	169	767
1963	100	500
1964	207	974
1965	283	1377
1966	400	1871
1967	525	2600
1968	741	4199
1969	572	3477
1970	332	3205
1971	253	2634
1972	240	2845
1973	310	3978
1974	350	4384
1975	323	4420
1976	272	4214
1977	226	3631
	Total 5950	Total 47881

Source: Boeing, "Dimensions of Airline Growth", March, 1978, p. 46.

It should be noted that only a proportion of aircraft in service are proposed for insurance at any one time.

To give some idea of losses, I've shown the major losses for hull (aircraft bodies) and liability (shown in fatalities) for 1958-1977 in Table 3. (It is unfortunate that no figures are kept as to the total value of these losses--i.e., the claim values.)

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8 Durant, March, 1978, p. 500.

Table 3. Major losses for hull and liability.

Year	Jets	Turbo-Props	Fatalities[a]
1958	1	10	222
1959	3	11	235
1960	4	12	459
1961	12	10	543
1962	9	12	767+
1963	13	7	515
1964	6	13	472+
1965	9	15	390
1966	15	16	955
1967	12	27	864
1968	28	23	899
1969	18	24	890
1970	28	35	1140
1971	15	28	1116+
1972	29	25	2018+
1973	41	21	1524+
1974	23	21	1723
1975	20	16	778+
1976	25	17	1406+
1977	26	22	1373+

[a]Includes passengers and crew for Western and Eastern built planes.

Source: A.I.S.L. Major Loss Record, Aviation Information Services Limited, Heathrow Airport-London, England.

The May 10th, 1978, Willis Faber Aviation Newsletter quotes: "'The market has been adversely affected by the current trend towards wide bodied aircraft which meant there was a greater concentration of risk in fewer aircraft.'" The Newsletter continues: "The above point relating to the concentration of risk in fewer aircraft is also illustrated by figures produced by the Institute of London Underwriters, showing that the [total] loss of 17 jets in 1977, compared with 22 in 1976, resulted in 930 fatalities against 607 in the previous year." (The figures I quoted previously do not agree with the number of jets lost but the 930 and 607 fatalities reported correspond almost identically to the 932 and 607 respectively for 1977 and 1976 that I show for passenger-only fatalities for Western built planes. The difference in the jets lies in total losses vs. major losses.)

With respect to risk involved, "a pattern of jet total losses is now evolving and, allowing for the odd statistical exception, insurers can now

expect not fewer than 20 jet total losses each year and, hopefully, not more than 25.... However, it is the value of the aircraft lost which is of most concern to the insurer and..., the changing pattern of passenger employment of high valued wide-bodied jets, has posed problems for the insurer which are by no means yet solved" (Webb, 1978, p. 4).

Jeffs states (1971) that "the gross premium income of the London aviation insurers at this time is difficult to establish with any finality, but my personal estimate is that in round figures it exceeds 60% of the world total of upwards of £250,000,000; of London's share, 75/80% is derived from airline business and this split as to approximately 70% of the Companies and 30% to Lloyd's. Well over 90% of London's business comes from overseas."

"The fleets of the four biggest airlines each total value around £750 [million] and carry the US flag..." (Jeffs, 1971).

Some specimen hull values and amounts at risk are:

Boeing 747	$45,000,000
DC-10	$30,000,000
Boeing 727	$13,000,000
DC-9	$ 8,000,000

All airline hull insurance policies (meaning the insurance of the aircraft themselves) contain deductibles to avoid exchanging small sums of money with the insurers (i.e., over flight ingestion and taxying claims seldom less than 1% of the aircraft value). Other airlines might carry an aggregate deductible over the whole fleet. Others co-insure or prefer burning-cost policies (that is they pay a comparatively small minimum each year they go claim free, but a substantially above average premium each year they suffer losses).

Legal liability (in respect of passengers and baggage) is difficult to determine in advance because one never knows whether any aircraft that is lost is full or empty and if full, full of US citizens--the most expensive in the world. So for a Boeing 747 the minimum most airlines insure for is $100,000,000 to $150,000,000 (Jeffs, 1971).

Westcott (May, 1978, p. 15) states there can be from $50 million to $200 million on any one accident for Boeing 747s.

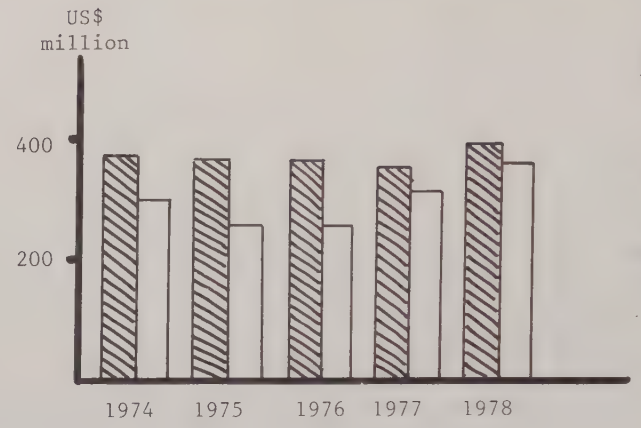
Westcott also states, "By the end of 1976 the aviation market had ceased to view the Boeing 747 in isolation. It was then no more than a contributor to the wide-bodied fleet of the world airlines. In the intervening years since the Boeing 747 was first introduced [1969], the DC-10 [1971],

the Lockheed 1011 [1972], and the A300B [1974] had entered airline service, the combined effect of which was to offer a spread of 690 wide-bodied units to the market" (1978, p. 16).

"The number of wide-bodied aircraft still accounted for under 14% of the overall units flown by the world's airlines but, because of their relatively high values compared to the conventional fleets accounted for over 45% in US dollar terms of the total airlines' fleet value. Therefore wide-bodied aircraft were providing the aviation insurance market with a considerable base on which to develop income, but in terms of the potential loss cost of a hull and 350 passengers, the income generated was fully justifiable" (Westcott, 1978, p. 16).

Some figures from Skandia's International Aviation Department's market summaries may serve to illustrate some of the points I have been discussing and come from Sven Brise and Lars-Olof Nordström's "Maintaining a Viable Aviation Insurance Market" in NFT: Scandinavian Insurance Quarterly, 4/1979, pp. 249-252. Input for the graphs presented in this article are drawn from Skandia'a EDP-system for aviation risks (the so-called MARIA-system) which registers data relating to all airlines with jet fleets valued in excess of US$ 20 million (excluding Aeroflot and the Civil Aviation Administration of China). The airlines included in the system together make up approximately 90% of the world airline jet fleet value and revenue passenger kilometers [Rpkm]. From graphs presented in the above article the following information is found: Revenue passenger kilometers have gone from approximately 400 billion in 1971 to over 800 billion in May of 1979. Fleet values have increased from approximately under $20 billion in 1971 to $50 billion in May of 1979. Hull and liability premiums have decreased during this period. Hull (as a % of fleet value) was greater that 1% in 1971 and is less than .5% in May 1979. Liability (US$ per 1000 Rpkm) was greater than .375% in 1971 and in May of 1979 less than .25%.

Graphs 1-3 are redrawn from the graphs which appeared in the article mentioned above. Graph 1 compares gross premium income with losses paid and outstanding from 1974 to 1978. Graphs 2 and 3 show 36 months average burn rate (the rate which would lead to breakeven results) for hull and liability from June 1, 1976 to May 31, 1979, split up by geographical areas, compared to current gross rates. Note the depressed rates in the US market (0 = USA, 1 = Alaska and Canada, 2 = Europe, 3 = South America, 4 = Africa, 5 = Middle East, and 6 = Far East and Australia) for both hull and liability. It is also interesting to note that the total world hull shows an approximate breakeven result but that liability does not.

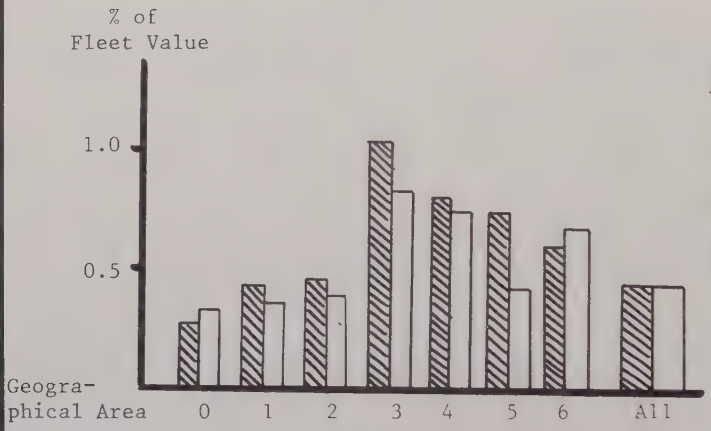


Graph 1.

Gross Premium

and

Losses Paid and Outstanding

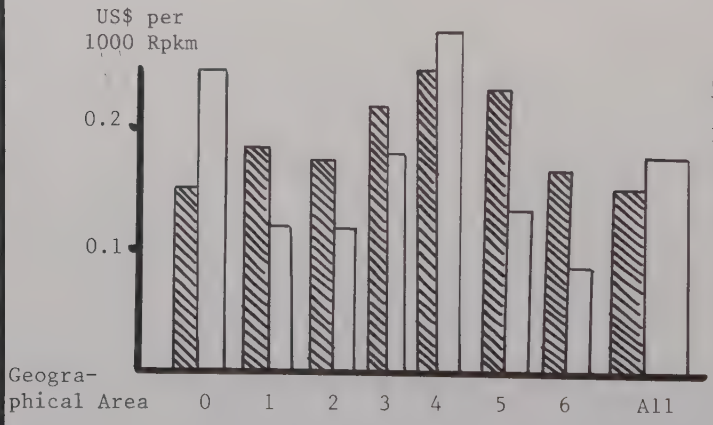


Graph 2.

Hull Gross

and

Burn Rates



Graph 3.

Liability Gross

and

Burn Rates

Source: Brise and Nordström, 1979.

The average settlement of liability claims can be as high as $400,000 per passenger within the US and $100,000 per passenger elsewhere. Thus total passenger claims may be 450 x $400,000 = $180,000,000 in addition to hull loss on a Boeing 747.

"Aviation premiums represent varying proportions of an airline's budget, the lowest being under 2% and the highest in excess of 10%" (Jeffs, 1971).

It is no wonder that "nowadays the insurance department of aircraft operators falls too readily under the financial director's responsibilities and with the highly competitive situation which currently exists it is all too easy for the financial director to be swayed by short term saving in insurance costs in his invidious task of minimizing the upward trend in fixed overheads to be borne by his airline" (Westcott, 1978, p. 21).

As an example to give some idea of airline premium income figures, I present some figures from a study quoted in the May 10, 1978, Willis Faber Aviation Newsletter. From "a survey of about 120 fleets, giving as far as we can see, a reasonable overall figure (ex. USSR), incorporating the vast majority of currently operating commercial jets and turbo-prop aircraft ... our calculations show that there is available approximately $360,000,000 of gross premium, split geographically as follows:

A. Europe $92,000,000

B. Africa, Middle East and Australasia $118,000,000

C. American Continent $150,000,000

If one considered that of the total derived premium income approximately 55% could be deemed hull premium, the resultant hull figure is $198,000,000. As regards liability premium, one should perhaps consider combining the $162,000,000, as calculated above, with that part of the manufacturers' products liability premium which is directly related to airline operations."

In the last 30 years the maximum limit has risen from approximately $25,000,000 to approximately $500,000,000, although it must be recognized that no one claim has utilized more than one-third of the available limits.[9]

Another example: Lloyd's publicity department (January 1979) provided the following figures for 1977 for aviation:

Premiums	Claims
£	£
129,311,680	133,542,728

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[9] Interviews, 1978.

(I might add it is the only substantiated proof that I've been able to find other than the interviewee's word and Skandia's graphs that 'there is more business but less profit.')

Faced with greater increases in the cost of aircraft (i.e., the era of the jumbo) and the greater risks involved in the transportation of such large numbers of passengers, the aviation market has had to greatly increase its capacity. But today the airline insurance market is faced with over-capacity (where capacity equals the amount of supply) and declining premium rates (i.e., from .5% of hull value in 1970 to .1% of hull value today for a major airline).[10] (Note: This does not agree with Brise and Nordström.)

Aviation insurers have to deal with a relatively small number of units (approximately 8000 aircraft) around the world as previously mentioned, each of which may involve losses of catastrophic proportions which are relatively unpredictable (Jeffs, 1971). This is broken down into approximately:

6000	jets
1600	turbo-props
400	pistons
8000	total

It does not include the USSR or Chinese People's Republic (CPR). The total value is about US $35,000 million, of which about half are operated by US based carriers, and one quarter by European.[11]

Therefore aviation risks must be distributed so that each of a large number of insurers has a relatively small net participation in each risk. Distribution is effected by means of:

- Co-insurance (where more than one underwriter accepts the risk and issues the policy of insurance),
- Reinsurance, and
- Retrocession (reinsuring the reinsurers).

The specialist aviation insurance broker performs an essential function in the aviation insurance market: By advising clients (aviation insurance and particularly the law relating to aircraft liabilities, is complex and the broker offers specialist advice on the cover needed), obtaining competitive quotations to secure the best terms, "placing" even the largest risks

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10 Insurance interviewee's comments; challenged by insurance manager of an European airline, October, 1978, "Show us proof--if they can go from .5% to .1% and still stay in business--they're still making a profit!"

11 From interviews, January, 1979.

by distributing shares across the world insurance markets, arranging reinsurance for those direct underwriters who require it, and collecting claims if losses occur from the many participating insurers.

"One of the basic principles of insurance is that it is long-term and envisages continuity of contract. Experienced intermediaries should be only too well aware of what happens if traditional insurers are overwhelmed by undiscerning competition. Healthy competition is the hall mark of any market--suicide is not!" (Westcott, 1978, p. 21)

Specialist aviation insurers may be: (1) Groups or pools of companies: These companies combine to employ jointly a single technical aviation underwriting staff, agreeing to share each risk in pre-determined proportions between member companies of the pool. Usually the pool of underwriters secure joint account reinsurance protection for all of the member companies. (2) Specialist companies: Effectively another form of "group", in which the participating companies are shareholders of the specialist company. (3) Departments of general insurance companies: Here, specialist staff are employed to underwrite aviation business for the company's account. Established mainly where there is a flow of aviation business, notably in London and the US. (4) Agencies: These provide technical aviation underwriting services for companies whom they themselves recruit. There are a few in London but mainly this is more common in the US. (5) Lloyd's underwriters: A member of Lloyd's in London handling aviation insurance through the Lloyd's network.

The distribution of aviation risks to the remainder of the world general insurance market is effected by the specialist insurers placing reinsurance (the art of spreading the risks accepted by insurers or underwriters amongst a number of reinsurers).

There are two main types of reinsurance: (1) Facultative and (2) Treaty. Facultative reinsurance is defined as the form of reinsurance where the ceding company (company which passes on business to the reinsurer), or the original underwriter, or the reinsuring underwriter, is under no obligation to accept. The term facultative is derived from the power of choice, which this method implies. The difference between treaty and facultative methods of reinsurance is that treaty is based on an obligatory arrangement binding both the ceding company and the reinsurer to certain specified risks up to certain limits. Such treaties are usually permanent (varying from 30 days to six months or even a year)--subject to cancellation notice from either party.

Aviation underwriting results are cyclical. These are apparently of about 9 years duration from profit, into loss, and back into profit. The pattern of recent cycles has been:[12]

1951 - 1953	profit
1957 - 1958	loss
1961 - 1963	profit
1966 - 1967	loss
1970 - 1971	profit

When there is profit in aviation insurance, many new entrants seek to acquire aviation insurance accounts. The capacity of the market expands relative to the demand for cover; competition to acquire business forces rates down until there are losses. The capacity of the market then contracts relative to the demand for cover (in fact, historically the demand has grown, with the increasing size of aircraft, to fill the capacity--but the effect is the same). When there is no longer over-capacity, insurers can adjust their premiums to profitable levels. When there is profit, well, the cycle begins again.

Bringing a major risk to the aviation insurance market includes the following players: (1) "original insured" (i.e., the airlines), (2) the "producing agent" (i.e., agents who direct foreign business to London or elsewhere, for example), (3) the "broking sector" (for instance, the producing broker advises the insured on the requirements, and seeks quotations from the placing broker who visits underwriters to obtain quotations), (4) "direct insurers" (The leading underwriter works out the terms and the quotation, the placing broker reports terms to the producing broker, who obtains the order from the client. Then the placing broker circulates among all the underwriters and cables the world markets collecting lines until the risk is fully placed.), (5) reinsurance brokers (mandatory for Lloyd's underwriters) or (6) reinsurers (it is optional to go through brokers or to go direct to reinsurers in non-Lloyd's), and (7) retrocessionaires (the reinsurance of the reinsurers). This can be seen in Figure 3.

General discussion of the airline insurance sector with specialists in airline insurance led me to conclude that there were four major areas of interest to the airline insurers:

- Current over-capacity and set limits,
- Changes in established insurance centers to a frag-

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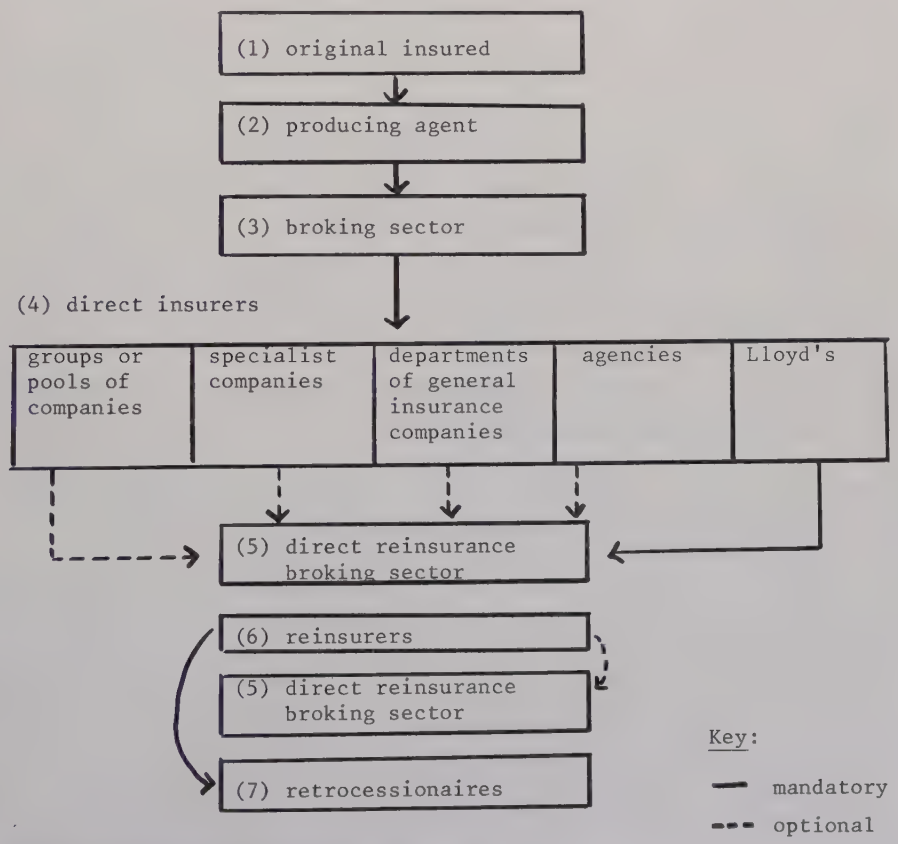
12 Interviews, January, 1979.

mented market,

- Changes in emphasis on underwriting methods, and
- How to establish a "realistic" premium rate.

(Note: As it is not possible to find out everything about everything, I decided to concentrate on these four areas for the majority of the study. There were many reasons behind this decision: (1) My analysis of the conditions existing in the insurance industry generally and initial interviews with airline insurers confirmed my opinion that these areas were broad enough to include most of the current trends in the industry; (2) The airline insurers could discuss these areas and were very keen to know what were some of the causes behind the current conditions; and (3) These areas would not disappear over time in the industry as they were too basic to its operation so could be the focal point for the second part of my study--the future.)

Figure 3. Bringing a major risk to the aviation insurance market.



2.4 Analysis of the data.

In order to describe industry conditions, basic concepts are needed. Economics contains a relatively compact body of concepts, hypotheses, and evidence about how these three parts relate. By using them it is possible to appraise and evaluate the degree of competition in real markets and also evaluate the benefits and outcomes of the market--i.e., How well is the market performing?

I will use as tools, some theoretical concepts to explain some of the data and facts about the industry that I have presented in Sections 2.2 and 2.3. (Note: There is no specific way of doing this. It is my opportunity to be creative and find a way of analyzing the data that best fits my problem.) This theoretical analysis of the industry is to try to understand some of the changes taking place in the industry over time.

"The conditions of market functioning are matters of positive knowledge of scientific information.... [Positive] analysis shows how the system functions. It explains both healthy and sick conditions. With this knowledge, one can then think normatively, to diagnose market problems and to define the best policy treatments for them" (Shepherd, 1979, p. 4).

Of course, the reality (the industry) to be evaluated is remarkably complex. But by using some basic tools one should be able to judge for oneself why markets are performing well or badly, and why. There aren't conclusive answers. "Even the most basic issues remain open. Most topics can be approached in a variety of ways, and the resulting answers are rarely uniform. The field requires art and judgment, as well as logic and pure scientific methods. One needs both common sense and a good, sophisticated feel for complex issues--plus a firm independence of mind. The private stakes in the answers are high, and so propaganda and self-serving assertions crop up repeatedly" (Shepherd, 1979, p. 24).

Some of the basic texts that can be consulted are Joe. S. Bain's Industrial Organization, 2nd edition, John Wiley & Sons, Inc., New York, 1968 and F. M. Scherer's Industrial Market Structure and Economic Performance, Rand McNally, Chicago, 1970 to evaluate markets from a societal, etc., point of view.

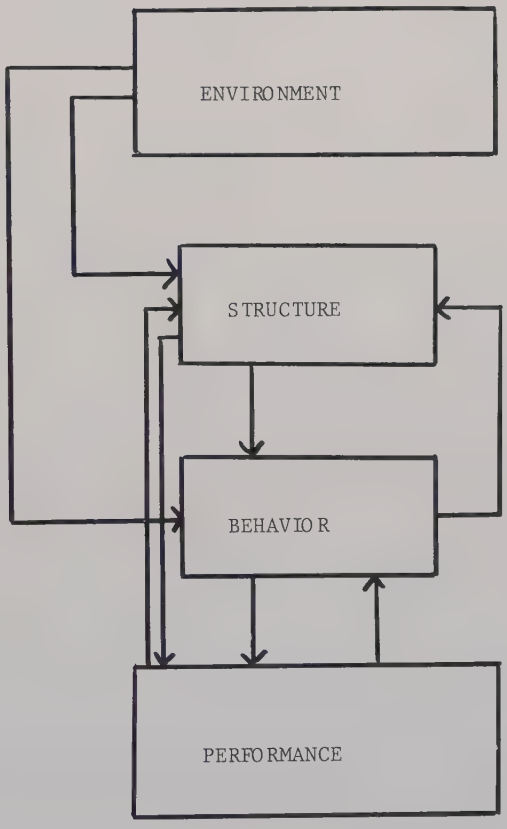
All markets (industries) have a structure, a pattern of behavior, and a set of performance results. The discipline of industrial organization shows how these relate to one another. By using these concepts it is pos-

sible to appraise (for example) the degree of competition in real markets, evaluate social benefits and costs of the market outcomes--in other words--how well the markets are performing.

The four-part system presented in Figure 4 "involves two basic hypotheses, which contain logical propositions that can be tested against the facts of real markets: (1) The underlying technology of a market shapes its structure [adjustment of production and ownership so as to maximize profits in light of its setting and technology], and (2) Market structure influences the behavior and performance of the firms in the market" (Shepherd, 1979, p. 4). Figure 4 also shows one way of searching for trends in the market place.

Figure 4.

Trend search.



Key:

→ = trends

Source: Idea originated from Shepherd, 1979, p. 5.

The airline insurance industry can be evaluated using some examples under each of the boxes in Figure 4.

Environmental determinants of economies of scale are not very important as it is possible for small firms to take big risks because they can always reinsure them. Currently the airline insurance industry is not regulated. If one looks at conditions which usually exist in industries that tend to become regulated (i.e., large economies of scale which create natural monopoly conditions, output that fluctuates steeply and regularly, output that is a basic necessity, and that usually has a high fixed capital--to name a few), these conditions are not found in the airline insurance industry.

Market structure is defined mainly by the distribution of size of firms within the market. The main conclusion to be made is that there are more sellers than buyers in the market. Concentration is on the buyers' side. The barriers of entry are very low for insurance companies in the industry or there would not be new entrants entering the market. Choices and changes are partly forced upon firms by external conditions and partly chosen by the firms as a result of their own strategies. If the individual insurance firms and the industry thought of itself as evolving through a series of choices among future strategies to maintain its market position, it would be possible to account for the current changing nature of the business (i.e., domestic vs. international) as a way of keeping its shares; likewise, increased reinsuring, diversification, and the seeking of new products and new services to offer. But is this so in the industry? It's not apparent.

Market behavior refers to the patterns of behavior that firms follow in adjusting to the markets in which they sell or buy. Partly because there are more sellers than buyers, it is a buyers' market, which leads to over-capacity, reduced rates, etc. Cooperation among sellers can be seen in various centers by the forming of insurance pools. There is intense price competition with insurers (the sellers) being willing to offer a low premium rate in order to keep existing clients and then reinsuring to protect themselves not just from losses but from very big ones.

Market performance refers to the end results that the firms in any market arrive at by pursuing whatever lines of conduct they engage in. For firms acting as sellers, results measure the character of the firm's adjustments to the demands for their outputs and for the buyers, the supply conditions of the goods they purchase. Some measures of performance could be price-cost patterns, profits, etc. There shouldn't be excessive profits, but profits should not be so low that the whole system could go bankrupt. Performance can also be seen as an evaluation from a public policy point of

view of the market--poor behavior causes more regulation. With poor leadership the tendency to use facultative underwriting increases to allow for individual evaluations of the risks to be insured. This makes for more price competition but increases the costs for the insurance companies. A balance must be made in the future between profit, costs, and regulation.

Analyses of market behavior could also be extended to models of price competition and cyclical patterns. For instance, in looking at what is happening in competition--the trend is to hold on to business at all costs--the few largest firms may fight (and are fighting) for each other's market shares. This is a chronic, direct problem for the leading firms. The trend to hold on to business at all costs--i.e., reducing the rates to rock-bottom --means that the direct insurers will take out more reinsurance which increases the business for the reinsurers who then reinsure which adds to fringe firms coming into the market and so on. This is a time-related process relating to actions and reactions over time rather than holding on to an equilibrium. An industry also needs to be evaluated within a context of transitions and evolution. Changes are partly forced upon firms as a result of their own long-run strategies of optimization. A perfectly competitive firm will be at the level of zero-excess profit.

This leads into a discussion of patterns of competition which is one way of looking at future behavior. Persson (1978) discusses four patterns of competition. Most markets have parts of all patterns. It is another way of describing the environment of individual firms. Persson's framework for competitive pressures on firms and on industry can be seen in the following patterns of competitive behavior: (1) Price theoretic pattern of competitive relations, (2) The quality competition pattern, (3) The power-struggle pattern, and (4) The regulated market pattern.

The insurance industry constitutes a number of interrelated markets and it is difficult to describe the effects of competition with simple models from economic theory (for example, airline insurance vs. other areas of insurance). Nevertheless, there are important traits of a price theoretic competitive pattern and, at present, that kind of pattern seems to dominate in the industry. Airline insurance is a well-defined product with a set number of buyers and an unlimited number of suppliers (virtually). All insurers are able to rely on profits from the investment side of their companies which also affects the competitive behavior. As mentioned earlier there are no barriers of entry to stop the inflow of new competitors into the market. The variations in profits can be attributed over the long-term to the market adjusting itself to "unrealistic" premium rates, therefore,

forcing bankruptcy on some of the smaller firms. London has been the price leader in the past which has made it the center of the insurance world. But with London not assuming this responsibility it must be left to the individual firms in other centers to set their own rates. This leads to a greatly fragmented market without a leader. There is not international regulation of the insurance industry nor are there any requirements to evaluate one's performance with respect to the market. It may be years before an insurer knows whether or not he has made a profit or a loss for a certain year. Lack of price leadership keeps competitive pressure at a formidable level and is an explanation for the cyclical variations in the market. London, acting in its past-price leadership role could keep prices at a high enough level to make normal profits. Alternatively, another leader could emerge. When profits are high new entrants go into the market; when they are low, prices drive the new entrants out. Lags in reaction to poor profits in the market cause the normal period of losses to be greater than usual and the unwillingness of some insurers to give up inspite of losses.

If one looks at the price theoretice model of competitive behavior, the airline insurance industry has two major characteristics: A well-defined product and the fact that every buyer is free to associate with every seller. In perfect competition all the shares are very small so there are no barriers and therefore many potential entrants to the market. It is easy for companies to go into this market because there are no regulatory bodies to prevent new entrants from coming into it. Past profitability and prestige of aviation insurance beckon new entrants to come into the market. Scale economies are not high enough to prevent new companies from entering the market, or from prohibiting new companies to be formed--such as captives. The effects of low barriers lead to a buyers' market. Regulations are implementable in national markets but are hard to implement on the international market (i.e., IATA). A question could be posed: If barriers to entry are going to stay as low as they are now, what developments will change the market?

As long as the insurance policies for airline insurance are treated as a well-defined product there is not very much of the quality competitive pattern. But as airlines and insurers diversify and new services are demanded and offered the pattern of price competiton may begin to vanish and leave more room for quality competition.

In the power-struggle competitive pattern, a struggle for market shares and power becomes more essential for the firms than competition with price or quality. Competitive pressure is often very high which induces firms to

take great risks in order to keep or increase their shares. On the global level sellers are too many to be deeply invloved in a profound power struggle with each other. The forming of groups has not, as yet, greatly changed this picture. The buyers control the market more than the sellers. One possibility of change could come through the increased formation of captive insurance companies by the buyers. The buyers would then be insuring themselves.

Currently the fourth pattern of competitive behavior, the regulated market, does not affect the airline insurance industry. Though there are lots of national regulations to protect buyers on the national level, there will be more international regulations and increased fragmentation internationally. The changing positions of developing countries and of the US will also affect regulations in the future.

Therefore, an analysis of the industry interviews and literature on the industry along the lines of Figure 4 gives some examples of current trends in the insurance industry:

- The airline insurance market is similar to the general insurance market.
- The price theoretic model of competition holds true for the industry.
- There is a well-specified market and product.
- There is little room for geographic competition.
- The low number of buyers and the international character of the buyers means well-informed buyers. There is little deviation in the handling of airline insurance.
- The low number of buyers also means cooperation of buyers against sellers.
- Buyers shop around a lot.
- Airlines are diversifying into other businesses.
- Government regulation is looming over the industry due to lack of proper leadership.
- The investment side of the insurance company rather than the insurance side of the company is very crucial to insurers being able to stay in the market.
- Business is held on to irrespective of costs.

This general and cursory analysis of some of the conditions and trends in the airline insurance industry stems from the discussions with industry. The next step was to identify what variables and their consequences are affecting some of these areas as input to the future scenarios in Chapter 3.

3. Results of the Study

Years ago a small wedding group, of which I was told about, was being ushered by the dean of a theological school through the huge Rockefeller Memorial Chapel at the University of Chicago. Among the group were an architect, and a farmer from Iowa. While the theologian was praising the magnificent building as a place of worship, the architect was appraising it as an architectural achievement, the farmer "turning on his heels, his head looking upward towards the incredibly high vaulted ceiling, was muttering to himself, 'I wonder how much hay this place would hold?'"

Each was seeing the building in terms of his own lifework. It indicated how subjective one's view is and how much one's view is an expression of one's own concepts.

Likewise, what is happening in the insurance industry today is contingent upon which player you are, in which center, etc., as are what assumptions you use for creating alternative futures.

This chapter deals with the results of the study.

3.1 Scenario writing.

As mentioned in Chapter 1 of this study, the study has two methodological problems to solve. The first concerns the choice of method for doing the forecast. The second concerns the analysis of the forecast results and their presentation.

Scenario technique will be used for the analysis of the data by going from the parts to the whole and for the presentation of the results.

Scenarios are alternative descriptions of what alternative situations might look like in the future. These descriptions cannot give all of the details and dynamics possible so stress certain points of view (even if selected arbitrarily) of whole pictures (for instance) vs. the development

of a few individual factors. The emphasis is not on exact predictions of what might be but their use as a guide post to the future.

Input to the chapter is based on interviews from October 1978 to September 1979. Originally, I had planned to present scenarios of 1990 and the year 2000 but found that there were enough gaps in 1990, let alone in 2000 to include scenarios of 2000. This is probably due to the interviewees difficulty in responding to that far away in time and is indicative of the "day to day" nature of and thinking in the industry.

Interviews are supplemented with my own thinking and general reading about the industry. Criteria for choosing alternative futures (assumptions behind environmental factors) comes also from my own thinking and reading experiences. Ideas from my whole background contribute to their creation. Some ideas for the future assumptions come from Kahn, et. al., 1977; Newman, 1978; Hall, 1977; and Ackoff, 1974--to name a few.

As scenarios are usually built on or performed in an explicit-time frame--a time model (i.e., in my case--1978, 1990, and 2000) is used to develop knowledge. The process of writing scenarios is to start with a few factors upon which new ones develop. They are affected by outside information (exogenous developments) and by information within the scenario (endogenous developments). This is done by sketching a paradigm of explicitly structured assumptions, definitions, typologies, conjectures, analyses, and questions and then constructing a number of explicitly "alternative futures" which might come into being under stated conditions--an explication of possiblities. It is for these reasons that I list my assumptions (as the reader will note introduces my scenarios of the future).

Ideas for the analysis of the information and presentation of the scenarios comes from a synthesis of Widman, 1980; Kahn, et. al., 1977; and Wikström, 1977(a)(b)--mixed with my own thinking.

Though I have tried to be extremely methodological and systematic in the structuring of the project, the structuring of the scenarios is a creative process and, so, is loosely structured.

The current scenario is built upon Chapter 2 which describes the conditions underlying the performance of the insurance industry today (see Section 3.4).

Table 4 gives my thinking steps for the scenarios. (The reader should keep in mind that ENVIRONMENT (general variables and assumptions) + INDUSTRY RESULTS = ALTERNATIVE FUTURES.)

Table 4. Scenario creation.

Scenario A — 1990

1) Listing of variables and assumptions.
2) General scenario.
3) Listing of consequences to the industry.
4) General scenario for the industry.

Scenario B — 1990

1) Listing of variables and assumptions.
2) General scenario.
3) Listing of consequences to the industry.
4) General scenario for the industry.

Assumptions about the environment and what the possible industry results might be are presented in Sections 3.5 and 3.6. Section 3.5--Main future alternative: 1990(a)--is an optimistic 1990 assuming available resources and continued economic growth. Section 3.6--Main future alternative: 1990(b)--is a pessimistic 1990 assuming limited resources and curbed economic growth. Selection of these two types of scenarios was arbitrary but seemed to be a good way of presenting the information, especially since the assumptions are more clearly positive and negative rather than the industry results which materialized from them.

The results of the interviews with key decions makers, literature sources, and my own thinking are analyzed and developed into the scenarios. To get from now to then irrespective of the opposition of the industry was as much a matter of creative thinking as anything else. Various long-range images and scenarios need to be developed to essentially replace negative and pessimistic views and established ways of doing and looking at things in the industry. (Chapter 5 presents a more detailed discussion of this step.)

3.2 Presentation of working model.

My problem was to develop a scheme to do this future study by--to use a method for gathering information. Then I asked questions to determine to what extent the information received serves the purposes of this study and what more is needed.

The research approach consisted of four stages:

Stage 1: By a series of preliminary interviews to key decision makers in aviation insurance and the airline industries in various insurance centers of the world, it was possible to find some factors or variables affecting each of the four main areas of this study--namely, (1) capacity/limits, (2) insurance centers, (3) facultative vs. treaty underwriting, and (4) premium rates.

These areas were selected from a synthesis of problem areas in discussions with key decision makers in the industry as the most frequently reoccurring. Other areas could have been included but my hypothesis was that problems in these areas were really symptoms of broader deficiencies in decision making and planning.

These interviews were informal and unstructured using a modified Delphi approach with key decision makers (modified in the sense of face-to-face iterative interviews rather than written questionnaires). The goal of this first preliminary stage was to identify current problem areas. The responses were then to be analyzed intuitively and compared to secondary data and literature sources on the industry and of other markets (see Chapter 2).

Stage 2: After the preliminary interviews the model was specified from the defined central variables. It was then possible to begin to feed in data to this model by more structured interviews.

The working model through out this study was the building up of a concise picture of the current problems in the industry. The base for this picture is how the key decision makers responded to the many questions I directed to them. The interviews built upon one another. The goal of this stage was to check problem areas and to identify affecting variables (current). The output was changed responses to early interview synthesis, indentification of affecting variables and new areas. The analysis entailed a synthesis of areas and affecting variables.

The framework for collecting and analyzing the data is shown in Figure 5 and is my working model. This model shws how the different parts are related to each other and, in turn, to the environment. It is structured after typical holistic models used in technological assessment--see Linstone, 1978 or Hetman, 1973 for further examples.

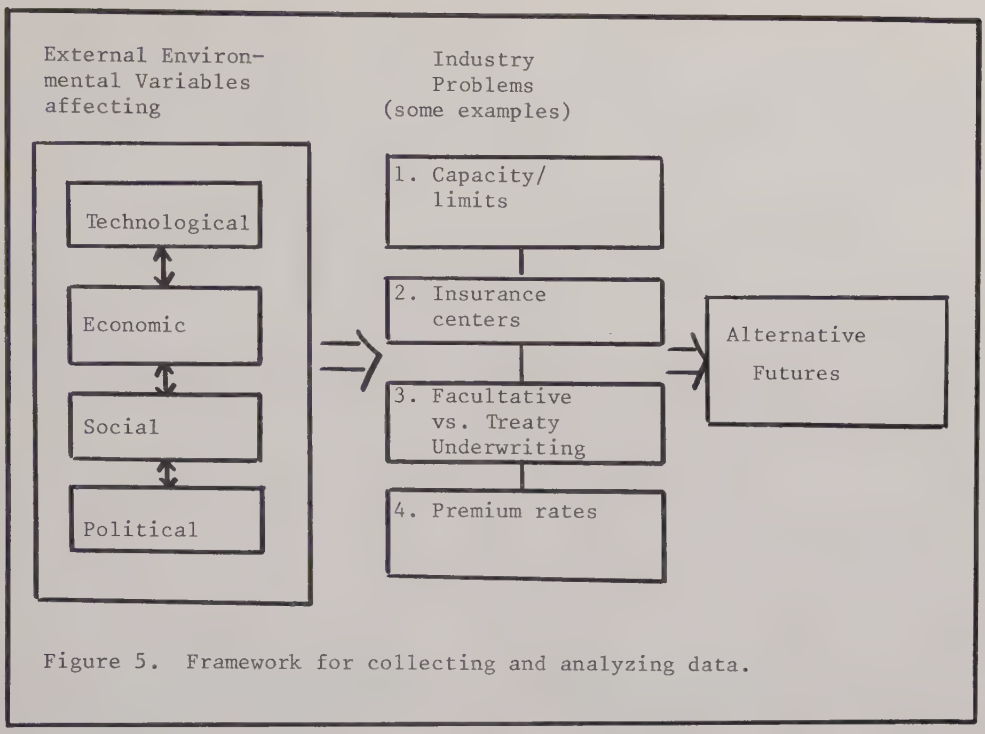


Figure 5. Framework for collecting and analyzing data.

Stage 3: This updated "new" picture was then rechecked as to areas and affecting variables to further refine the developing pictures. This led to the final format for analysis of the current scenario through feedback from the industry, my own thinking, and as compared to other markets. This provided the structure for identifying new areas and affecting variables over time.

Stage 4: Another round of interviews to follow through with the current picture's affecting variables and problems over time was partially carried out in this stage. The results of this stage were analyzed and then developed into various scenarios for the medium-term (to 1990). These scenarios include how the four affected areas might turn out and how developments in these four areas affect the market behavior of the airline insurance industry.

3.3 Information sources.

As mentioned earlier, input to the study was through structured and

and unstructured interviews with key decision makers in the airline and insurance industries, and my own thinking based upon literature on the industry. Limited materials to work with from the interviews is based on the fact that the interviewees often had very little to say about the future.

Section 3.3 is an explanation section: It's aim is to present a coding system to tell where the information in the scenarios comes from; to state what the statements are based on (i.e., what's behind them).

For each assumption in Section 3.5 and Section 3.6 in the "listing of consequences to the industry", I've attached a number(s) in parentheses to identify the sources of information. The code is as follows:

(1) majority opinion among the interviewees that this is or might be so,

(2) outside developments from the airline insurance world,

(3) mentioned by a single interviewee or by a minority of interviewees,

(4) literature,

(5) deductions from theoretical discussions, and

(6) assumptions from which there is no special support.

Hopefully, this will add to the increased credibility of the scenarios presented. But as they are the starting point only in the thinking process for planners in the industry to use--the readers must judge the ideas presented for themselves from their own perspectives.

3.4 Current scenario.

There are no strong leaders in the market today. Rates are low. Profits are poor on the insurance side. London is barely holding the lead position. Pressure is being exerted from other market centers: France, the US, Japan, Sweden, Switzerland, and Germany, to name the major ones.

Insurance needs are changing. There is more reliance on the third world for business. There is pressure to develop new insurance products and new services. Though the market needs better statistical data and more professional analyses of it, there are very few insurers doing this inspite of the need.

The airlines want to continue to get cheap rates. They are beginning to diversify more and more. Fuel costs are escalating and airlines are seeking ways ways to economize. Fares are increasing. IATA is losing its strength and there is fragmentation rather than international unity.

The US is keeping its business more and more at home--i.e., the New York Lloyd's has been created. Limits are increasing. There is questionning of the broker's role and increasing formation of captive insurance companies. Fleet values are increasing as older jets and aircraft are being replaced by wide-bodied aircraft. At the same time the average age of most fleets is around 8.5 years.

Insurers keep entering the market, forcing existing ones to hold on to business at all costs. Brokers are taking advantage of the situation.

The investment side rather than the premium side of insurance is the profit maker.

3.5 Main future alternatives: 1990(a)--an optimistic alternative future.

1) Listing of variables and assumptions.

Technological:

1. Current problems are the result of too little technology and capital and not the reverse situation. There is rapid technological development and confidence in technological solutions for solving problems.

2. The important resources are capital, technology, and well-educated people. It is assumed there is sufficient land and natural resources for all.

3. Though there is rapid development, it is necessary to hold down costs of energy, minerals, and food.

4. Technology is used to protect and improve the environment.

5. Technological developments must be constantly reassessed in terms of risks and benefits.

Economic:

1. There is a high ability within the world economy to survive and react quickly to shocks (i.e., the possibility of war).

2. There is rapid economic development.

3. The only limit on growth should be population is some lesser developed countries.

4. Progress in one area will increase progress in another.

5. High consumption is encouraged. Though the rich get richer--the poor benefit.

6. There is trust in the market system.

7. Though there are large price fluctuations, this will probably be self-correcting over a few years time.

Social:

1. Society must be prepared for unexpected catastrophes.

2. Doomsayers are always scandously wrong. It is only flattery to our egos that current problems are more important and difficult to solve than ever.

3. Promotion of man's expansion to new frontiers (increased publicity): Oceans and space.

Political:

1. Political conflicts will continue and possibly escalate.

2. There will be more government interference but only to a practical degree of public regulation.

3. There is a possibility of a war. There is a low degree of international cooperation. Other unexpected shocks such as the 1973-74 oil crisis are expected to occur.

4. Third world countries form cartels around similar resources. The industrialization of the lesser developed countries continues.

2) General scenario.

Therefore, the optimistic 1990 has a basic premise behind it--that of expansion. There are not known exact limits to what resources are available either through new discoveries or new uses of old materials. The more one produces, the more one can produce.

There is a mandatory increase in technology and capital. New technology and greater investment will continue to increase production but also to improve the environment. There will be no drastic shortages.

There will be successful management and decision making. Developments within the current market system can handle most problems. A low level of government regulation and internal cooperation will take care of the rest.

There are sufficient resources. Barring some extraordinary occurrence, resources are adequate to support even four times the amount of population we now have on this planet--and be able to provide adequate (middle-class standards) food, energy, and pollution controls for all.

There will be stabilized growth but resources are sufficient to adequately take care of needs of increased population and production.

A growth tactic will be new innovations and discoveries. Though new developments cause new problems, they often solve old ones and are necessary to upgrade the quality of life.

There will be decreasing income gaps and poverty. Both the rich and the poor will get richer but gaps will remain nonetheless.

There will be continuing industrial development. Industrial growth in the third world will continue.

There will be a gradual improvemat of the quality of life. Greater external costs for this must be adequately internalized.

The future outlook is reasonably good. Poverty will be conquered (at least on the road to being conquered) but there will still be misery over wealth and luxury.

3) Listing of consequences to the industry.

Technological:

1. Capacity of current airplanes will remain at current levels (i.e., 480 in any one jumbo).(1)(4) Liability cover will increase because it is available.(1)

2. The US will build a supersonic but the environmental protectionists will limit the number allowed to fly to keep the ozone level from changing.(1)(4) The manufacturers will be Boeing and McDonald Douglas.(1)(4) There is a divided opinion about ozone levels--the supersonics may not develop any further.(1) Wide-body aircraft will be used and are more acceptable because of cleaner technology.(1)(4) Though Concorde is safest from a testing standpoint, noise and exhaust levels are a detriment to its expanded use irrespective of the amount of fuel it uses.(1)(4)

3. Rockets will be used for cargo transport on a limited basis.(3)

4. There will be no immediate changes in plane technology but flight decks will be improved.(1)(4)

5. Though new improvements will be expensive, their performance will be better (more cost efficient).(1)(4) The technological improvements will balance the higher cost of fuel.(1)

6. Airlines will continue to diversify into such businesses as hotels, charters, and communications.(1)(4)

7. Technological advances in navigation and stronger bodies will make the planes safer so manufacturers will get better rates.(1) The very great expansion of air passenger travel induced by the jets causes problems of air traffic density; delays and collision risks escalate at airports.(1)(4) The industry assuming that the expansion in demand for air travel would continue unchecked) has the only solution of lifting up more passengers in each aircraft unit.(1)(4) This would also engender further expansion by permitting fare reductions through more economic operation.(1)(4) Hence more and bigger wide-bodies.(1)(4)

Economic:

1. The task of the insurer is to establish a pool of premiums out of which losses may be paid--the many effectively paying for the misfortunes of the few.(1)(4) The underwriter must relate contributions (i.e., premiums) to the degree of risk presented by the insured.(1)(4) This is done by varying the rate of premium charged, and by varying the extent of cover given.(1)(4) With risk declining, rates will also decline.(1)(4) This will not alter, however, the increased fixed costs of the insurers and cause many firms to close down due to mergers, consolidations, or bankruptcy.(1) Brokers' fees have been reduced which causes further cost problems (i.e., big brokers becoming larger and smaller ones smaller).(1) All insurers charge the airlines for inflation and, therefore, higher rates, but wages for repairs increase faster than one can foresee.(1) The insurers accept losses to have the premium income, as they earn money through the investment side.(1)(5) There are two schools of thought--look carefully at the risk (facultative) or is the premium sufficient to cover costs (basically the aim of treaty)?(1) The realistic risk rate will obviously become more important with the availability of more reliable statistical data.(3) However, the old rule of supply and demand will remain a decisive factor.(1) Whether catastrophe reserves will be built up will, among other things, also depend on the tax situation in the various countries.(1) And last but not least, the economical situation of the airlines and the policy of the governments controlling many of them could have an effect on the future of aviation insurance in the private markets.(1)

2. The number of jet aircraft in airline service (12000+) is still not enough for reliable actuarial assumptions and predictions to be made regarding loss patterns.(1)(4)

3. Bad days are hidden by other insurance sectors.(1)(4) Insurers will continue to hold onto aviation insurance even if it

is a small account.(1) Economics will force insurance to do something, but not necessarily aviation insurance.(1)

4. The market rate will certainly continue to be influenced by the size of the competition.(1) It is not considered to be a viable strategy to heavily reinsure to be able to stand on one's own two feet in a firm.(3) Brokers continue to control the market resulting in more captive companies as business is based on sales or assets.(1)(4) Captives are fashionable for three reasons: As a tax shelter, financially attractive (confidence in your own risk), and as an ideal way to go directly into the insurance market.(1)(4) Insurance pools are organized for domestic markets and cannot go outside of their markets so are weak organizations and big market losers.(1)(4)

5. In practice no international ceilings are set on limits though they are established by conventions (exceptions being on US domestic flights).(1)(4)

6. International aviation is fragmented.(1)(4)(5) Inflation, fuel crises, reduced growth rates, and poor financial positions indicate that an airline must be very efficient to make a profit.(1)(4)

7. No one market dominates in insurance.(1) The market needs to be put together in large blocks to be controlled in the market.(3)(5) London won't stay the center.(3)

8. Aviation is a self-contained insurance world.(1) As a service industry it operates on a day-to-day basis.(1) There is a need for diversification.(3)(5)

9. Facultative underwriting will decrease (because of its expense) and insurers will rely on treaty (except for the large insurers who can afford it).(1)(4) The use of facultative is to keep in touch with the market trends and possibly to increase interest in major airlines.(3) The bulk of the business though comes from treaty underwriting as small companies cannot accumulate the necessary know how in a very specialized branch at reasonable cost.(1)

10. The tendency to facultative underwriting is due to poor leadership in the market.(3)(5) As the lead job is not being done, underwriters and large reinsurers write the risks themselves (facultative).(3)

11. Lower fares and charter business do not affect an airline's insurance package.(1) Rates will be frozen for the short-term.(3)

12. There are no shortages in the market.(1)(4) Risks are determined by feelings and personal opinions and are not calculated in a sophisticated manner.(1)

13. There is over-capacity in the market.(1)(4) Capacity is always there and will always be there, but at a price.(1) That price can be almost anything.(1) The aviation insurance sector is such a fraction of the over-all insurance market that it hardly matters if it is run at a profit or at a loss.(1)

Social:

1. Travel will continue to grow.(1)(2)

2. Environmentalists will continue to be against supersonics.(1)(2)(4)

3. Insurers are affected by: (a) Growing sophistication of accident investigation methods--producing ability to pin-point blame.(1)(4) (b) Growing cult of "consumerism", "anti-pollution", and "anti-corporation" attitudes of mind.(1)(2) (c) In the US particularly, "no cure/no pay" basis of legal representation exists (where the lawyer is entitled to a share of the award if successful or may agree to accept nothing if unsuccessful). (1)(4) The probability of having to bear legal costs is a deterrent to legal action in other countries.(1)

4. There is a conflict between private and public property. (2) The cost of travel is a drain on natural resources--i.e., human beings, so, therefore business travel should be reduced. (3) The deepening interest in the environment increases costs to the airlines.(1) The consumer demands lower fares and better service.(1)(4)

5. The danger areas for insurers include an increasing ability to trace cause of loss back to manufacturers.(1)(4) There is an increasing incentive to do so because of statutory limitations on liability to operators.(1) The insurers are also affected by the consumer movement, the extreme legal sensitivity to big corporations, and the US legal developments.(1)(4)

Political:

1. Government intervention on two fronts: Brokers prevent underwriters from establishing direct links with airlines and less and less information is given to the brokers.(1)(3)

2. Increases in limits will largely depend on inflation, court rulings, ratification of international conventions, acceptance of new conventions and the possibility of changes in the US legal system, etc.(1)(4)

3. There are practically no special laws or regulations on the subject of aviation insurance.(1)(4) But it is concerned with the law in three respects: (a) Policy conditions that the insured observes the law concerning aircraft safety.(1)(4) (b) Operators may have imposed upon them, by law, certain statutory liabilities to the public, to passengers, and to the shippers of cargo.(4) (c) Legal practices and precedents in different countries affect the handling of claims and the extent of liability claims payable under aviation policies.(1)

4. Manufacturers' liabilities not discussed before the 1950s and 1960s--after that date, discussions are due to the consumer movement, the fact that there is no written products liability law, increasing political questions to changing the law, lobbies to close down the manufacturers, and issues of how to compensate life.(1) The problem of liabilities rests with the manufacturers

--apply political pressures.(1)

4) General scenario for the industry.

Nothing happens. Absolutely nothing happens. No changes take place in the industry. No leaders emerge. Rates continue to be poor. London deteriorates as a center--the current leaders have all retired. France emerges as a center--the new center--with fewer leaders. There is an international shuffling to see who will be the winner. The contenders will be the US, Europe, Japan, and London.

Insurance needs are changing. There will be more reliance on the third world for business. There will be a greater need to develop new insurance products. The insurance business will have to be more creative and offer new services. Competition will have to be encouraged. With no changes and consequently no leader emerging, there will be more emphasis on statistical data and professional analyses for the acceptability of the risks insured--each will have to make his own decisions. This will make insurance more expensive.

But the airlines will continue to want to get cheap rates. They will have to diversify: Hotels, charters, and into communications. Business travel will decrease but pleasure travel will continue to increase. IATA will collapse. Cut-throat competition among the airlines will result. There will be no difference between scheduled and non-scheduled economy flights. Captives will be formed to self-insure their risks. Consumers will want lower fares and better services. First-class travel will be out. There will be a greater trend towards government vs. commercial airlines. There will also be continued fragmentation rather than international agreements.

Governments will impose more curfews on airlines (i.e., no night flying). Rate increases will have to be approved by government(s). There will be more international business and consequently more laws regulating it. Developing countries will close their doors to foreign insurers through heavy regulations and develop their own market. Reinsurance will continue to play a large role in the market partially to avoid government regulations. Liability cover will increase. International conventions will be updated or thrown out. Laws will continue to become more and more complex which will only increase costs.

More and more government regulations and bureaucracy will be present--

both for the airlines and the insurers. This will create more expenses and will encourage nationalism--nationalized airlines and nationalized insurance companies. Brokers will be curtailed. Insurance will be looked at on its own merits. Limits will be increased. Fleet values will increase--the trend will be toward wide-bodied aircraft, single-class flying and noise and exhaust regulations. Improved flight decks and technological improvements will balance the high cost of fuel. The capacity will be there but there will be a tendency for companies to merge together, to form pools, and associations for working together.

People will continue to pour into the market, rates will continue to fall. Insurers will do anything to keep existing business so will reinsure heavily. Brokers will take advantage of the situation which will lead to governmental regulations. The investment side of insurance rather than the premium side will continue to be the profit maker. This will continue until both insurance and the airlines are completely government regulated.

Cheap rates will lure airlines outside the usual centers. Insurers will continue to rely on the investment side of the insurance firms to cover overheads and for making profits. Airlines will be reluctant to go to higher rates especially since aircraft performance and safety will have increased. Government regulation of the airlines and inflation will make the airlines' performance financially poor. This will lead to an even greater trend towards captives and looking elsewhere for insurance. Just as airlines will have to diversify, so will insurers. Insurance will become more sophisticated and will be dominated by highly skilled investment and financial-types.

As aviation is only a small part of the insurance picture and doesn't affect the over-all picture at all, profits or losses will continue to make very little difference. Risks that in the past were deemed unattractive will be normal business due to better liability laws and safety requirements. With a greatly fragmented market and increasing government regulation of the airlines, solely aviation insurers will have to diversify or offer greater services to their clients (i.e., legal, etc.). There will be a changing nature of insurance and aviation as societal goals are reassessed. International political deterioration will also affect the industry and lead to more regulation and controls due to the necessity to allocate resources to priority areas (i.e., defense, etc.). Though there will be adequate resources, greater efficiencies will have to be exercised. Profits will be made but more effort will have to be put into the effort to make them.

Though a strong leader might emerge in the market this would have little effect except to reduce expenses. Premium rates might slightly increase but governmental regulations will be with the insurers and airlines no matter what happens. A strong leader could also stop, curb, or reverse the trend of fragmentation and governmental regulation to a certain extent. But the threat of war and internal and external political upheavals will tend to greater nationalism and regulation.

But as airline and aviation insurance operates in its own little world, world-wide environmental conditions will not drastically affect the industry.

3.6 Main future alternatives: 1990(b)--a pessimistic alternative future.

1) Listing of variables and assumptions.

Technological:

1. There are increased governmental regulations.

2. Energy issues have escalated. The limits of resources available are uncertain and there are possibly no solutions to limited resources (acceptance instead of wishful thinking). Revolutionary resource handling is needed. There are increased limits to land use.

3. The increased technology and capital required as resources reach marginal levels will increase shortages and pollution. Solutions for pollution and resource allocation will be increasingly short-sighted. There will be increased pollution and deterioration of the environment. There will be enormous waste generation making it very difficult to recycle/absorb pollutants.

4. Climatic changes will continue. There will also be increasing destruction of the oceans' ecology.

5. New discoveries will postpone making real decisions about problems. Discouraged search for new inventions (due to drain on existing resources--natural and capital). The tendency will be to buy time with technological decisions.

6. Need to change goals and values: Automation and appliances do not necessarily increase human happiness nor is high technology the same as a good life.

7. High probability of nuclear and/or biological warfare.

8. There will be no solution to public transportation and utilities deteriorating for a decade.

9. Global communication will be more sophisticated.

Economic:

1. The economic situation will be poor. The world-wide inflation escalating for a decade will be out of control.

2. There will be cut backs in third world industrialization and development.

3. Management will be local and decentralized.

4. Growth will be slowed in developing countries. Further growth could be exhaustion of some resources. Conservation of resources will be everywhere mandatory. There will be curbs on excessive consumption. Changed value bases; demand is not need nor is GNP wealth, for instance. There will be a great need for restraint, cutbacks, basic changes in values and objectives.

5. There will be unrelenting demands for growth and competence. The rich will become richer and the poor becoming poorer leading to ever widening gaps between the rich and the poor.

6. There will be a trend away from bigness.

7. There will be poor returns from investments. Much more effort will be needed for economic gain.

Social:

1. Society will tend to avoid real problems and issues.

2. There will be local and decentralized management. The emphasis will be on the community/regional level. The sentiment will be "anti-bigness".

3. There will be much self-interest. Social disintegration will be wide-spread. There will be increased conflict of issues and interests. Values (leading to a wholesome and satisfying life) will be destroyed. Revolutionary changes in values will be needed.

4. There will be anti-big organization, anti-big government, and basically a fear of governmental control.

5. The tendency will be to turn away from investment, to be anti-big business, and to mistrust the "free market" system.

6. There will be over-crowding.

7. The emphasis will be on cultural, environmental, and ecological heritage rather than national heritage. Society will turn away from technology.

8. There will be large-scale damage to the environment. Pollution problems will be escalated and unsolved. Increased destruction of ecological balance will also be with us.

Political:

1. There will be a rapid building up of public issues and pressures with a lack of a fully thought out response by governments and leaders. Poor policies will be set by governments. The political situation will be deteriorated. There will be desperate political crises with a loss of confidence in national leaders to deal with world problems. Domestic political scandals will be increasing.

2. War: US/Soviet confrontation which will escalate to a war on resources--this will postpone solving any national problems. Increased potential for war will continue on a regional basis (with limited warfare in 1990). There will be a worldwide warfare on a regional scale. Third world combat will be rather futile.

3. There will be a greater proliferation of bureaucracies. This increased tendency to bureaucracies will have a very poor ability to solve problems. There will be harsh authoritarian governments and mandatory reforms.

4. The poor nations will form cartels to sell their limited resources at extremely high prices. Future developments should be in the third world. The poverty of the lesser developed countries will be prolonged. The third world will be formed into cartels.

5. There will be an eroded position of the US in international affairs and a very fragmented world.

2) General scenario.

Therefore, the pessimistic 1990 has a basic premise behind it--that of increased limits. There are known fixed limits to available resources. The rich countries will continue to have and the poor will continue to be poor and to have not.

There will be marginal returns on increased technology and capital spending. It will be necessary to spend more money on extracting marginal resources to the detriment of the environment.

Management and decision making in general will be a failure. There will be rapid change, increasing complexity of problems and conflicting interests making changes imperative--i.e., changes in values, simplification of issues, etc. Revolutionary changes will be needed.

Resources will be inadequate. Food scarcity, pollution problems, and energy shortages will continue.

Current growth will be uncontrolled. Exponential growth in population and production will deplete resources to exhaustion.

New innovations and new discoveries will be a postponement tactic. This will postpone the necessary decisions making the eventual collapse even more severe.

Income gaps and poverty will increase. "Class war" will be inevitable. It will be the haves vs. the have nots.

Industrial development will be a disaster. Industrial growth world-wide could halt; poor nations would not be selling their resources so cheaply or so rapidly.

The quality of life will have deteriorated. Economic growth means deterioration of the environment and ecology, over-crowding, and continued urbanization. Values must be changed (i.e., market demand is not the same as need, GNP is not the same as wealth, etc.).

The future outlook is one of an emergency situation. Revolutionary changes are needed to avoid irreparable damage to the planet through ruined environment, harsh authoritarian governments, and war.

3) Listing of consequences to the industry.

Technological:

1. Airlines will continue to try to get cheap rates.(1) There will be no major new developments in aircraft--only improvements on flight decks, etc.(1)(4)

2. The airlines will have to diversify into other areas (i.e., communications).(1)(4) The insurers will also have to diversify or expand their concepts of services offered.(3)

3. US supersonics will probably be developed.(1) Environmentalists will limit the number allowed to fly to keep ozone level at proper levels.(1) Wide-bodies will continue to expand. (1)(4) There will be increasing government regulations on noise levels and exhaust levels.(1)(4)

4. Technological improvements will balance the higher cost of fuel.(1)(4)

5. There will be no immediate changes in plane technology. (1)(4) Flight decks will be improved.(1)(4) Basically, it will be a wide-body market and single-class flying.(1)(4)(3)

6. There will be more emphasis on statistical data and on professional analyses of technological conditions (facultative underwriting).(3)

7. Aircraft improvements will be on the line of making them more fuel economical and cheaper to operate.(1) There will be technological advances in navigation and stronger bodies, therefore, making the planes safer.(1)(4)

Economic:

1. Business for both the insurers and the airlines will need to be more creative.(1) They will both need to broaden their business concepts of the scope of what they are doing.(3)

2. Competition will be encouraged.(1) The insurers will offer new services on the claims side.(3)

3. London organizes itself towards a coordinated direct underwriting effort and also to create a large capacity block.(3) New and fewer decison makers world-wide in aviation.(3) Most of the leaders will be retired in London--there will be a race from within London to see who emerges as the new leader.(3) The French market steps in.(3) At any rate the industry needs to be put together in large blocks to be controlled in the market.(1)

4. There will be a guillotine hanging over the airlines over airfares.(3) The trend will be towards government vs. commercial airlines.(3)

5. Capacity is always there and will always be there at some price.(1) That price can be almost anything.(1) The aviation insurance sector is such a fraction of the over-all insurance market that it hardly matters if it runs at a profit or at a loss.(1)(4)

6. The US dollar might be so down that it will no longer be used as an international currency.(1)(2) There will be a greater balance between Europe and the US.(3) The US will probably shrink down in aviation insurance.(3)

7. There will be a more sophisticated market.(3) If an effective leader emerges--the emphasis will be on treaty underwriting as others will follow the leader.(1) If no leader emerges facultative underwriting will be emphasized.(3)

8. Limits will be dropped.(1)

9. New markets will be developed.(1) Therefore there will be less chance of over-capacity.(3) There will also be fewer entering the market in the "red".(3)

10. Airfares will be low with increasing charter service.(3)

Social:

1. First class travel will be out.(1) Business travel will be reduced but pleasure travel will be increased.(1) There will be greater developments of mass air travel in the Far East (Singapore, Korea, Taiwan, Japan, and China).(3) The environmental questions will be constantly asked: "When will the water at tourist spots be so bad tourists must stay away?"(3) Tourism will continue to grow.

2. Doctors are concerned about the spreading of disease all over the world.(3) There is an increased awareness of the cost of travel (i.e., as a drain on natural resources and on human re-

sources).(1) The consumer will insist on being better informed. (1)(2)(4) A deepening interest in the environment will increase costs for the airlines.(1)(4) There will be continued demands for lower fares and better services.(1)

3. There will be more emphasis on statistical data and on professional analyses of operational conditions.(3)

4. Noise and pollution controls will be implemented in the US, Japan, and in Europe.

5. There will be one ticket and one currency for travel.(3)

6. The danger areas for insurers will be an increasing ability to trace the cause of loss back to the guilty party.(1) There will be increased consumer awareness, extreme legal sensitivity of big corporations, and changes in US law.(1)

Political:

1. The world-wide political structure will be one of fragmentation.(1) Changes will be taking place at large with increased pressures on world order (i.e., airlines will go solo rather than working for international cooperation).(3) There will be an increasing dependency for fuel on the third world.(1) (4) New political alignments will be formed.(1) Newly formed nations will want their place in a new economic order.(2)(3) There will be a growth of a regional association of nations (different goals from that of major nations--looking inward and not to international cooperation which will lead to even greater fragmentation).(3)

2. There will be more and more bureaucracy: (a) both airlines and insurers must spend more money for administration to cope with legislation, (b) EEC regulations will continue, (c) the tendency will be to encourage nationalism (to stay un-nationalized will be less profitable as overheads go up).(1)(3)

3. Europe will have many curfews (i.e., no night flying).(1) The actions of CAB will affect the world world-wide.

4. The Warsaw convention will be updated or disregarded.(1)

5. Legal regulations will increase but most will be in or only under national laws.(1)

6. IATA will collapse which will lead to cut-throat competition.(3) There will be no differences between scheduled and unscheduled flights.(3) Insurance of political risks will be limited to a small percentage of the claim.(3) If the claim exceeds this amount, the Ministry of Transportation will step in.(3)

4) General scenario for the industry.

The theme of this scenario is limits making governmental regulation inevitable for the industry. A strong leader or personality in the market

might emerge but basically regulations will be the name of the game.

The manufacturers will be regulated. Laws will be passed with respect to liabilities. Rates will continue to be low so insurers will broaden their markets by expanding their idea of what their business is. Airlines will also have to reassess themselves and diversify even with the trend of nationalized airlines vs. commercial ones. Most insurance companies will also nationalize. Regional associations of airlines will be formed rather than a strong international cooperation of airlines. New political alignments will be mandatory due to the severe restrictions on fuel and expense. Nationalization will be easy on the insurance side due to the fact that most of the players from the last decade will have retired from London thus causing it to deteriorate as a center. The international climate in which a consequential shuffling takes place does not result in a leader though the US, Europe, Japan and London each tries to emerge.

The US shrinks down in size within the market. Unsatisfactory legal developments in the US causes new laws to be passed further regulating the legal profession with respect to liabilities. IATA collapses and airlines are regulated by national laws. All flights are economy class. Business travel has shrunk enormously in size--inexpensive charter flights for toursim compensates for the difference. National Ministries of Transportation control the airlines. Conventions continue but are under national laws only. Brokers are drastically curtailed and have very little control of the market. There is a great deal of turmoil in the third world. Cartels and new political alignments are formed to strengthen their positions with the more developed countries. Airfares are highly regulated by the national governments.

Wide-bodied jets are the main aircraft being used as there are fewer flights and to fewer places. Fuel is obtainable but at absurd prices. A very expensive, streamlined no frills one-class flying is all that is available. Concorde-type flying has been discontinued. Aircraft are being developed to be more fuel economical and cheaper to operate. Improved flight decks and increased safety requirements (due to the large numbers travelling in each aircraft) are the only new developments.

Premium rates will be fixed for the nationalized airlines and nationalized insurance companies will be highly regulated. The insurance market will have fewer players and will show greater stability. Reinsurance will continue to be a major factor in the market. The insurance industry will still rely heavily on investments but profits will be heavily taxed. Infla-

tion, a preponderance of regulations, extremely expensive and limited fuel, etc., will all lead to a very poor picture in the industry. Political turmoil on all levels and societal unrest will make the great amount of governmental regulations very unpopular but inevitable. Governments will not be liked or trusted.

3.7 Other possible future developments.

This section gives some details of further possible developments. The scenarios presented show the main routes of development but there are a number of other ideas that complement the main scenarios.

(1) The changing role of insurance managers: (a) The clerk (the 9 to 5 type of person who is doing today what he will be doing until he retires) will continue; (b) The insurance manager schooled in risk analysis, risk abatement, risk assumption, and risk transfer whose viewpoint is limited to these four areas in his own company and usually just in his own domain will also continue; but (c) The risk manager who looks outside his organization at the whole industry will increase in the future.

(2) Should war be declared, government will take over war-risk insurance as was done in World War II.

(3) Greater educational requirements of insurers; more degrees in insurance to include technical and theoretical aspects of insurance, finance, accounting, statistics, tort law, etc. A "chartered risk manager" should be offerred to gain professional status of such a person such as "chartered public accountants" in the accounting profession.

(4) Formation of a world-wide insurance regulatory body.

3.8 Summary of results and their contribution to the industry.

My original aim was to get specific information over time about the key issues affecting the following areas: Capacity/limits, insurance centers, facultative vs. treaty underwriting, and premium rates. They were chosen from a synthesis of problem areas in early discussions with the industry as the most frequently reoccurring problem areas and as those areas the insurers were usually able to respond to in one way or another. Other areas could have been included but my hypothesis was that problems in these

areas were really symptoms of broader deficiencies in decision making and planning and that they were what I was really trying to uncover anyway and to look at some of the consequences of what these deficiences would be.

Though the specific areas mentioned above were the focus of the majority of my study, I realize now and in the latter stages of it, especially, that it is impossible to ask specific questions about sensitive detailed areas of an industry. Instead, though I did not get specific answers to the questions I raised about these areas, I did get some general answers about the broader pictures underlying these specific areas. These broader pictures are presented in my scenarios (Sections 3.5 and 3.6) which point to important alternative developments for the industry in detail. Section 2.4 also touches upon possible changes in patterns of competition that may change the situations of individual firms to a great extent.

The two main alternative futures which emerge for the industry are a "no change" scenario and a "heavily regulated" scenario. Though there are greater differences in my basic underlying assumptions, which are clearly more positive and negative with respect to environmental factors, the industry itself seems to operate in a sort of vaccuum. Whether the future is positive or negative, the effects on the industry are not that dramatic.

My "no change" 1990 scenario presents a picture of the industry with few changes from the current picture: No changes taking place in the industry, no leader emerging, rates continuing to be poor, industry fragmentation rather than international cooperation continuing to escalate, and expenses both for the airlines and insurers increasing due to more governmental bureaucracy and complex laws being passed. All this will lead to and encourage nationalism both for the airlines and the insurers.

With a greatly fragmented market and increasing governmental regulation of the airlines, solely aviation insurers will have to diversify or offer greater services to their clients (i.e., legal, etc.). There will be a changing nature of insurance and aviation as societal goals are reassessed. International political deterioration will also affect the industry and lead to more regulation and controls due to the necessity to allocate resources to priority areas (i.e., defense, etc.).

A strong leader could also stop, curb, or reverse the trend of fragmentation and governmental regulation to a certain extent. But the threat of war and internal and external political upheavals will tend to greater nationalism and regulation.

My "heavily regulated" 1990 scenario presents a picture of the indus-

try that doesn't differ radically from the "no change" scenario except in degree. Governmental regulation is inevitable for the industry--the airlines, the insurers, and the manufacturers.

Airlines and insurers will both have to reassess themselves and diversify even with the trend of nationalized airlines vs. commercial ones increasing. This holds true for the insurers also, whether they remain commercial or become nationalized.

Regional associations of airlines and insurers will be formed rather than a strong international cooperation of, for instance past attempts of international cooperation of the airlines with the formation of IATA. New political alignments will be mandatory due to the severe restrictions on fuel and expense. Nationalization will be easy on the insurance side due to the fact that most of the players from the last decade will have retired from London thus causing it to further deteriorate as a center.

Unsatisfactory legal and economic developments in the US will cause new laws to be passed further regulating the legal profession with respect to liabilities, especially. IATA will collapse and airlines will be regulated by national laws.

Premium rates will be fixed for the nationalized airlines and nationalized insurance companies will be highly regulated. The insurance market will have fewer players consequently and show a greater stability. Reinsurance will continue to be a major factor in the market. The insurance industry will still rely heavily on investments but profits will be heavily taxed. Inflation, a preponderance of regulations, extremely expensive and limited fuel, etc., will all lead to a very poor picture in the industry. Political turmoil on all levels and societal unrest will make the great amount of governmental regulations very unpopular but inevitable.

Section 2.4 touched upon some possible changes in competition patterns which will also have their effects on the developing pictures of the insurance industry in general and airline insurance in particular.

There shouldn't be excessive profits, but if profits are too low the whole system shouldn't go bankrupt. Performance can also be seen as an evaluation from a public policy point of view of the market--poor behavior causes more regulation. With poor leadership, the tendency to use facultative underwriting will increase to allow individual evaluations of the risks to be insured. This makes for more price competition but increases the costs for the insurance companies. A balance must be made in the future between profit and regulation.

Airline insurance is a well-defined product with a set number of buyers and an unlimited number of sellers (virtually). This could change in the future through diversification, and the seeking of new products and services to offer. And as insurers diversify and offer new services the pattern of price competition will begin to vanish.

In the power-struggle competitive pattern, firms struggle for market shares and power. But in the airline insurance industry, the buyers, not the insurers (the competition) control the market.

There are no barriers of entry to stop the inflow of new competitors into the market. The variations in profits can be attributed over the long-term to the market adjusting itself to "unrealistic" premium rates, therefore, forcing bankruptcy on some of the smaller firms. London has been the price leader in the past which has made it the center of the insurance world. But with London not assuming this responsibility it must be left to the individual firms in other centers to set their own rates. This leads to a greatly fragmented market without a leader. There isn't any international regulation of the insurance industry today. Nor are there any requirements to evaluation one's performance with respect to the market. It may be years before an insurer knows whether or not he has made a profit or a loss for a certain year. The changing positions of developing countries and of the US will also affect regulations in the future.

As airline and aviation insurance operates in its own little world, world-wide future environmental conditions, whether positive or negative, do not dramatically affect the airline insurance industry according to the results of this study. The loose connection of the industry with the general global developments could easily be a reflection of and reflected in the day-to-day nature of the business.

Two weaknesses kept coming to my attention in all the centers that I travelled to: The lack of any future thinking (call it planning, if you like) in the industry and the lack of industry-wide data (though there is some available, it is seldom used) and any appreciation of economics and finance outside of the tiny domains that the interviewees operated in. The rare exceptions stood out like sore thumbs. Though everyone talked about poor profits, etc., there seemed to be more talk than action in the industry to do anything about it or even to gain any understanding why this is so and what can be done to actively change this condition. It was incredible to me the number of top decision makers (i.e., managers of their offices or firms) who could not discuss the broader picture of where they fit into

the market and how they could affect changes in their positions. Though they were often quite knowledgable on their specific domains--figures could seldom be procurred to substantiate points and observations being made. That I was kicked out of offices for asking detailed and rather sensitive questions on the industry, that I was stared at incredibly when it dawned upon the interviewees that I was doing a "serious" study, etc., did not surprise me as much as it confirmed my own opinion about the lack of thinking in the industry beyond the specific job at hand.

But my conclusions are that a future study's main value lies in encouraging the reader (i.e., management, etc.) to think creatively about future alternatives. The goal of a future study is not to come up with a right or a wrong answer as the industry often expected that I would come up with. It could be viewed as a sort of learning process both for the writer and for the reader. There is much resistance to future studies as planning for several contingencies (scenario forecasting) creates much busy work, so companies usually prefer single-line extrapolation. This didn't work out very well in predicting the 1974-75 oil embargo by OPEC, for instance (Graham, 1979). It is also very difficult to get management to imagine different ways of doing things and to plan for them. Skeptics say you can't predict the future. But by being alert to various changes, you can get a sense of what's coming (at least that's the theory!)

Some companies doing future studies (i.e., Technology Futures, Inc., Austin, Texas) operate on the theory that ideas appear in print well before they make an appreciable change. These "business intelligence programs" comb publications for future signals. That is what I have done also. I have combed the airline insurance industry for signals of things to come and hope that some of the ideas and thoughts presented in this report will appear in this paper and not somewhere in the future.

But instead of predicting as this area--future studies--started with, the emphasis is on coping with uncertainty. Rarely is one alternative given. A future study will give several different alternatives challenging existing perceptions and getting people to think hard about the future or just to think about the future at all would be enough.

Therefore, the results of a future study are to show a future made up of a number of alternative development sequences by systematically investigating what will happen in an area under different conditions.

This study sought to find changes in the airline insurance industry and how to identify what possibilities for adaption to these changes there

are in the market. It can function as a map for decision makers in reviewing their thinking about their place in the market beyond the present. That they open their windows and not just look out of them will have made it all worth while!

Part II

The Methodology

4. About Future Studies Methodology

This chapter presents to the reader what future studies are all about by defining future studies (Section 4.1), by telling how to structure a future study (Section 4.2), by presenting some alternative methods for doing a future study with (Section 4.3), and by giving some criteria from the literature of how to evaluate a future study (Section 4.4).

4.1 Future studies defined.

Future possibilities can be envisioned and studied in a meaningful way. In a rapidly changing society it is essential to do so. Near-term problems must be anticipated if they are to be dealt with in any meaningful fashion. Those doing future studies think that it is possible to learn something about the future but have at the same time a greater appreciation than most traditional scholars of the immpossibility of knowing exactly what is going to happen. The anticipations that result are not offerred as certainties but as possibilities and are based on technological, social, political, etc., trends.

Schwarz, et. al. (1980, p. 3) state future studies can be character ized by the general aim of aiding decision makers by yielding information of relevance in a long-range perspective. Thus, future studies cannot be narrowly associated with some specific technique of analysis but should be considered a generic concept encompassing a series of activities within a broad field. It would be more accurate to say that there are alternative or complementary ways of dealing with the future.

Certain characterisitics of future studies are as follows. These characteristics are taken from Schwarz, et. al. (1980, pp. 3-8) as being the most representative of those trying to define future studies but I have also included comments from other sources that agree with my thinking about the subject.

(1) Time horizon. It is not the time span (i.e., 5-50 years or even longer) or the time period (i.e., beyond the next 2 or 3 decades) which characterizes future studies, "it is more the emphasis which is put on how things vary in time" (Schwarz, et. al., 1980, p. 3). What are the opportunities available, dangers present, choices, etc?

Some approaches are more appropriate to a short-range time horizon, others when you have a long-range time horizon. For the "in between" time periods, the choice of methods depends very much on the kind of problem.

Though both planning and future studies are future-oriented, planning usually has a relatively short time span (i.e., up to 10 years), whereas future studies are concerned with the long-term, typically ranging from 10 to 50 years and sometimes even longer (i.e., Beckwith, 1967; or Kahn, et. al., 1977).

(2) Problems. The problem areas of future studies tend to have an open-ended character in at least three respects: (a) The problems often do not fall directly within the area of responsibility of an existing administrative or policy-making unit but cut several boundaries. (b) Often an interdisciplinary approach is needed in connection with complex real-world problems. (3) The problem formulation may constitute the major part of the analysis and precise solutions can seldom be expected[13] (Schwarz, et. al., 1980, pp.3-4).

Simmonds (1977, p. 14) states, "A typical futures problem is almost exactly the inverse or opposite of normal science. The problem cannot usually be aptly-defined, nor precisely-structured; the probabilities of success or failure do not add to unity on any basis; the measurments may or may not be accepted; and since there is not normally general agreement on the basic assumptions, communication requires the establishment of a basis and agreed language between the researcher and the client."

(3) Uncertainties and discontinuities. Some authors believe the main element of future studies is the "identification of discontinuous changes and innovations" (Shani, 1974, p. 643) under primary or pure uncertainty (i.e., when the dimensions of possible results are unknown) (Schwarz, et. al., 1980, p. 4).

(4) Criterion of adequacy. It is not the purpose of future studies to produce predictions of future events but to deal with the design of alterna-

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[13] See Rittel and Webber, 1973, pp. 160-167, for a discussion between "tame" and "wicked" problems.

tive futures (Schwarz, et. al., 1980, pp. 4-5).

Shani (1974, p. 643) states that it is the tendency for planning to view the future on the basis of quantitative changes which necessarily reduces the number of variables and alternatives to which planning may address itself. Future studies, on the other hand, looks at a number of possible futures and attempts to explore environmental variables in order to assess their impact on whatever system is being considered. Calder states (1969, p. 255), "It is more important to show the connections between different future events and between future events and present events, than to attempt painstaking, detailed and 'precise' forecasts of particular events."

The future studies research is not a forecaster, although he might make forecasts. The distinction between alternatives, forecasts or predictions should be clarified. Cornish (1969, p. 247) states, "A prediction is a statement that something will happen and implies at least a reasonable degree of certainty. A forecast is a statement that something will likely happen, and while it suggests considerably less certainty that prediction it nonetheless connotes a wager of sorts on the realization of what is proposed. [An alternative] however, is simply a statement that something may happen, and suggests no particular degree of probability. It is a statement merely of possibility."

Nor is the future studies research a planner--not even a long-range planner--though he might do long-range planning.

Shani (1974) and Cornish (1969) both state that the future studies researcher begins where planning leaves off. "A planner sets forth a table of instructions for an organization to follow; he is seeking to set forth in reasonably precise terms what the organization will seek to accomplish. The futurist suggests the possibilities--the opportunities and the dangers --inherent in the future, so that the policy maker can determine the goals and the planner can specify a sequence of integrated measures to reach the goals" (Cornish, 1969, p. 247).

"The futurist is being misused if he enters the decision-making process only after policies have been established, for one of his principal values is that he can enlarge the spectrum of future possibilities envisaged by policy makers and clarify the possible consequences of a policy. The futurist may aid planners by giving them a better feeling for the environment in which the organization's plans must be realized.... The futurist's visualization of possible future realities should be of material assistance to the planners, who must translate policies into concrete measures" (Corn-

ish, 1969, pp. 247-248).

(5) The role of theory. Future studies often cannot rely on estblished theories defining sets of causal relationships, nor or they atheoretical, but could "have an effect on the development of theories within various disciplines" (Schwarz, et. al., 1980, p. 5).

(6) Techniques of analysis. Future studies usually combine methods (i.e., intuitive plus formal or quantitative techniques) (Schwarz, et. al., 1980, p. 5).

The techniques and methods used further distinguish planning and future studies. "Planning with its orientation in the present, would have to use past data" (Shani, 1974, p. 644). The methods appropriate for planning are data-based, emphasizing analytical and quantitative methods.[14]

On the other hand, future studies' base-line is in the future, where there is no hard data. Though future studies take into account information available or existing trends and developments, their use is on forecasting and exploring alternatives and not on making a precise prediction. "The techniques most appropriate for future studies are non-data based methods and particularly those incorporating imagination, intuition and tacit knowledge" (Shani, 1974, pp. 644-645). The typical methods, all of which are based essentially on expert knowledge, are:

- Scenario writing
- Delphi technique
- Cross-impact matrix
- Morphological analysis
- Simulation and gaming
- Etc.

(7) Proximity to application of results. "The proximity to application of results of future studies may vary considerably" (Schwarz, et. al., 1980, pp. 5-6). de Houghton (1971, p. 61) states, "normative forecasting is planning that is inseparable from management," whereas "exploratory forecasting" is a "neutral probe in search of information." Toffler (1970, p. 407) states, "Every society faces not merely a succession of probable futures, but an array of possible futures, and a conflict over preferable futures. The management of change is the effort of agreed-on preferables. Determin-

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14 See, for example, Steiner, 1969, for a further description of planning techniques; de Houghton, 1971, or Coates, 1974, for a further description of future studies techniques.

ing the probable calls for a science of futurism. Delineating the possible calls for an art of futurism. Defining the preferable calls for a politics of futurism."

"The emphasis in planning would be on a systematic analysis while future studies would stress creative synthesis" (Shani, 1974, p. 645). Though future studies would use some of the techniques of planning they also require artists, philosophers, and writers, particularly of science fiction. Future research is an art and a branch of politics, states Calder (1969, p. 255). He goes on to say, "If the prime use of statements about the future is not to provoke vigorous argument at a high political level, our studies and speculations will be either dangerous or sterile."

(8) Linkage to planning process. Schwarz, et. al. (1980, p. 6) and Shani (1974, pp. 646-647) both state future studies and the planning/decision making process are closely linked. Shani states, "the characteristics should be regarded as being a continuum with planning at one extreme and future studies at the other." This is shown in Figure 6.

Figure 6. A continuum of planning and future studies.

Planning is a process that involves making and evaluating each of a set of interrelated actions before action is required, in a situation in which it is believed that unless action is taken a desired future state is not likely to occur, and that, if appropriate action is taken, the likelihood of a favorable outcome can be increased (Ackoff, 1970, p. 4).

And, as planning is "predicated on the belief that the future can be improved by active intervention now" (Ackoff, 1970, p. 23), this will enable management to make plans in the current uncertain environment instead of just buying options.

Traditional planning has a time frame from 1-5-10 years but as Steiner (1969, p. 7) points out, there is generally no accepted meaning of planning. Another definition is Friedmann's (1967, p. 225), who sees planning as "guidance of change within a social system." Future studies begins where

traditional planning leaves off (according to Shani, 1974). But as de Jouvenel (1967, pp. 127-128) states, the principal and most important objective of future studies is their contribution to the improvement of decision making.

Shani (1974, p. 640) states further, that organizational planning "is a formidable obstacle to future studies, which should be liberated from ways of thinking conditioned by existing organizational patterns." "Thus while in planning reference to the future world [inevitably has] to be from the organization outwards, in future studies the orientation would be from the environment to the organization" (Schwarz, et. al., 1980, p. 6).

The differences between planning and future studies are presented in Table 5.

Table 5. Planning vs. Future Studies.

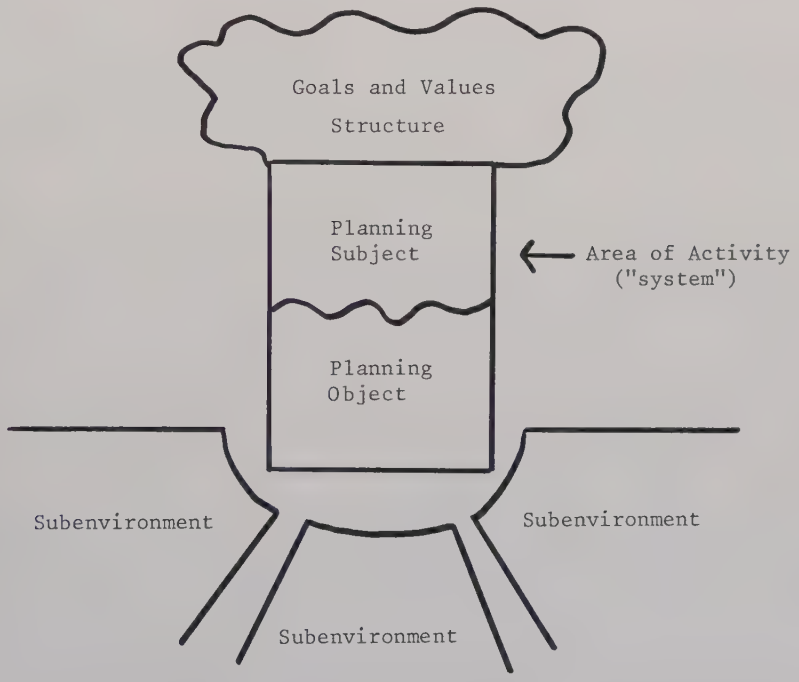
Characteristic	Planning	Future Studies
1. Output	Set of decisions	Background and context for decisions
2. Extent of detail	Fairly detailed	Relatively undetailed
3. Organizational location	Within the policy making organizational setting	Usually outside the policy making organizational setting
4. Time element	Relatively limited	Relatively unlimited
5. Involvement in power struggle	High involvement	Low involvement
6. Time-span	Up to 5-10 years	Usually beyond 10 years
7. Techniques	Mainly data-based, rigorous, analytical and quantitative techniques	Mainly methods involving imagination, intuition and tacit knowledge
8. Mode of publication	Internal, occasionally public	Public, occasionally internal
9. Evaluation	Mainly based on performance	Mainly based on anticipation

Source: Shani, 1974, p. 647.

Though a clear distinction is presented in Table 5 between planning and future studies, Shani states the lines are really fuzzy between them. I agree with him. A clear distinction between the two is not possible. Systematic analysis could be used to identify current conditions in the industry (i.e., a planning approach) whereas creative synthesis could be used to identify changes in the variables affecting these current conditions over time and the consequences of these changes (i.e., a future studies approach).

To show even further this close linkage between planning and future studies, Ingelstam (1977, p. 129) formulates a minimal frame of reference or model in which planning problems can be described which I have presented below in Figure 7.

Figure 7. A cenceptual model of planning problems.



Source: Ingelstam, 1977, p. 129.

Where (paraphrased from pp. 129-130):

Area of activity ("system") = what is to be planned,

Environment = the whole rest of the universe,

Subenvironment = divisions of the environment which interact with the area of activity,

Planning object = division of area of activity--what is being planned "for",

Planning subject = division of area of activity--what does the planning,

Goals = established by planning subject and from the outside, and

Goals and values structure = ultimate goals.

Based on Ingelstam's analysis, Schwarz, et. al. (1980, p. 6) state, "Planning is sometimes described as a process involving the preparation of a set of decisions such that a 'system' or 'planning object' can be adapted to its 'environment' in a way that is consistent with prevalent goals and values." From Ingelstam's description[15], it follows that planning needs to be based on information about the future development of the environment of the "planning object". Studies like this would be a form of future studies where the role is to yield direct inputs to the planning process.

(9) Values, goals, and norms. Values and norms cannot always be explicitly stated in future studies as they would vary with the alternative scenarios. The changing nature of values and norms can be included as elements of scenarios (Schwarz, et. al., 1980, p. 7).

All studies and their potential are open to criticism. Those "for" future studies see them as innovations for improving decision making. Those "against" see them as a "a pleasant intellectual exercise, lacking practical value" (Shani, 1974, p. 648). Planning, like future studies, does not deal with all aspects of the future, but both are ways of presenting alternatives --whether short-term or long-term, respectively. Since decision making is forward looking and decisions made in the present are intended to achieve results in the future, decision makers must address themselves to a particular image of the future. Most organizational decisions are made on the assumption that the future will be similar to the present or that past trends will continue in the future. "Without future studies the tendency may be to rely in a random way on a single view of the future which would result in limiting the freedom of choice for planning" (Shani, 1974, p. 648).

Future studies or future research have as their chief purpose "to re-

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15 See Ingelstam, 1977, pp. 127-145, for the complete description.

hearse opportunities, dangers, and choices, rather than to make categorical forecasts. Whenever a statement about the future is conditional on human decisions, this qualification should be emphasized even at the risk of stating the obvious" (Calder, 1969, p. 255).

Calder continues (1969, p. 255) to state that the selection of alternatives or goals is much too important to be left to political whim or the pressures of enthusiastic specialists or even the private fancies of individuals involved in future research. The most useful thing future researchers can do is to lay before politicians and decision makers "a set of coherently formulated goals, critically annotated but showing the great range of possibilities from which they have to choose."

4.2 Future studies structuring.

"Properly speaking, there can be no study of the future, because one cannot study what does not exist" (Cornish, 1969, p. 245). Therefore the future study researcher must content himself with studying alternative futures which are simply statements of what may come to pass in the unknown future.

The researcher must be adept at generating his own subjects of the study. Implicit in future studies is the conviction that each time one looks forward in time one may and should generate a wide variety of alternative futures and not just one, which would be a forecast.

After generating his alternatives, the researchr has a number of options: To estimate the probability of specfic alternatives being realized under given conditions; to evaluate the alternatives in terms of their effects; to see which are desirable, undesirable; etc. Once an alternative is formulated, it becomes the basis for another set of alternatives leading to a long chain of alternatives fanning out to include a bewildering complex of potential realities.

How to structure the background material of the problem area being looked at is the basic problem of future studies.[16] Future studies are not

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[16] Material for this section, unless referenced specifically, is based upon class notes from Future Studies' courses on the doctorial level from 1972-1977 at Stockholms University; Wikström, 1973, pp. 45-53; and the author's own experience in the field from 1978 to the present.

primarily to predict developments, but instead, aim or focus on how developments will be under different predictions or possible futures.

Some of the important ingredients for a future study are to answer or identify the following questions:

- What developments are possible/probable in this field?
- What are the future needs of these potential developments?
- How to analyze the effects of development alternatives?
- How to be more and more creative?
- What are the facts all around the developments and problem area being considered?

The steps required in this planning process are: (1) Projections or forecasting--estimation of possible/probable/true alternative development lines as seen from actual knowledge and development trends; (2) Evaluation --estimation of the effects of different development lines, in different sectors and between sectors; and (3) Planning--analysis of projections and evaluations to be able to formulate the direction various alternative developments will take and to determine when and where decision points will be.

The starting points for a future study therefore are: (a) What is known now--in various different knowledge areas, the speed of developments and which direction they will take, the restrictions in the systems studied, alternative possibilities, and the time constant for events examined; (b) Aims--surrounding influences, decision background, description of the system, visions, etc.; and (c) Strategy--scope of the problem, complexity of the analysis, choice of parameters, etc.

Therefore, the scope of the problem is the first step for every future study. Of course, the scope or boundary can be remade if need be. (This step assumes a prior step of problem finding.)

de Bono (1978, pp. 24-26) states that there are three types of problems:

(1) The 'block' type--the road is known but there is a block in the way. The point is that the problem can be located, identified, and focused upon. This can be seen in Figure 8.

(2) The 'run out of road' type--more information is needed in order to proceed. This can be seen in Figure 9.

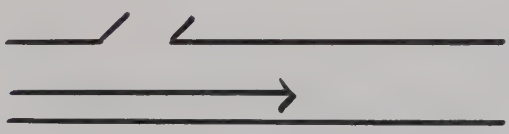
(3) The 'problem of no problem' type--here there is no block, the road is wide open so there is nothing to react to or focus problem-solving atten-

tion upon. The road is open and the opportunity turnings are completely missed. Later, when the main road peters out (i.e., market disappears), narrows (i.e., low profits), or is blocked (i.e., government regulation) the need to go backwards and search for the opportunity track begins. This can be seen in Figure 10.

Figure 8. The 'block' type of problem.

Figure 9. The 'run out of road' type of problem.

Figure 10. The 'problem of no problem' type of problem.



Source: de Bono, 1978, p. 26.

The choice of boundaries (complexities) depends both on the aim of the analysis and the subject being analyzed.

The fact that the researcher must generate his own material to be studied, his role might be seen as more artistic than scientific. Cornish (1969, pp. 246-247) states the researcher "is an artist first, a scientist second, and a cost-benefit analyst third."

As an artist: The first question is "What might happen in the future?"

"The task of the futurist is to stimulate his imagination and give it enough room to develop many futuribles [alternatives]. Each is to be based on the situation he is contemplating; each is, to use Bertrand de Jouvenel's phrase, a plausible 'descendent of the present'" (Cornish, 1969, p. 246). Bizarre and far-out ideas must be considered. For instance, "In 1900, such futuribles as moon landings, cities under the ocean, Horoshima, and Hitler would have been dismissed out of hand by almost every normal adult" (Cornish, 1969, p. 246).

As a scientist: Once alternatives are generated, they can be studied. The question now becomes, "How likely is it to happen?" After postulating various conditions, probabilities of its occurring can be assessed using statistical procedures, simulations, Delphi technique, etc.

As a cost-benefit analyst: The question becomes, "How will this alternative affect us if it is realized?" A value--positive or negative--may be assigned to the alternative.

Decisions cannot always be made or based only on hard facts or knowledge. Forecasts are "often written in a guarded manner, with an emphasis on hard facts and a remarkable reticence about difficult points. An important part is played by confidence in the constancy or continuity of causal patterns of an economic, social, or technological character" (Halldén, 1976).

Halldén (1976) continues to state, "It seems that a certain kind of ignorance is relevant to [the] belief in constancy. Great changes in the world of tomorrow involve the presence of precursor events today. If no precursor events are revealed by a careful inspection of present conditions, the investigator has the right to assume that changes will be unimportant." It is not possible on just underlying facts to compare different sorts of parameters in the decision process. The evaluating of alternative developments aims directly at underlying decisions. These must then be joined to the goals of the sytem. It is important to try to make clear <u>where</u>, <u>when</u>, and under <u>which</u> parameters the evaluation is centered upon.

The remainder of this section (4.2) will discuss a number of choices the researcher must make in structuring his future study.

<u>Comprehensiveness vs. usefulness</u>. What needs to be done to describe the reality and its developments? The main aim of the description can be several things: To understand how changes and development patterns come up and in which direction they are going or are steered or to give as well as possible the underlying reasons for specific chosen situations. There can

be a description-oriented or management-directed method of attack. They have different aims, methods of working, material facts, choice of parameters, and precision.

If the direction is a descriptive one, the analysis needs to carefully survey where the decision points are and to determine what the factors are making this a decision point. This would also be true if management-directed. The number of parameters may be very many in the first case but probably just a few in the latter case. Though both approaches should be as comprehensive as possible, the management-oriented one will be more focused.

What is right vs. what is important. A comprehensive analysis probably will contain many parameters which will have relatively little influence on development patterns at large. It is especially important if management-directed to choose carefully the important parameters. Known or well-described parameters may not necessarily be the important ones.

Structure vs. goal requirements. Description can be based on what is thought to be possible or what might be. A structure can easily contain restrictions which will not be valid over a longer time perspective. Goal requirements can formulate wishes which are improbable to attain.

Quantitative vs. qualitative description. Quantifying with precision the outcomes and diminishing possibilities to random understanding, cannot be easily controlled and is very difficult to make.

One parameter vs. many parameters. A single description of a system should be done with just one parameter. This would then contain translation problems between parameters of different kinds. A separate presentation of different types of parameters can give a less controversial description and clearer picture of different bases for estimates.

Intuition vs. formalization. The relationship between different factors in a system can be analyzed intuitively. Is it humanly possible to synthesize the system or cut it into smaller pieces that afterwards are put together in formal models?[17]

A careful analysis would contain a combination of methods as there is no one best method for all problems, though there may be better methods than others for structuring and analyzing individual problems. Therefore, the results of an analysis must be judged with a clear insight as to the boun-

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[17] See Magrabi, 1965, pp. 633-637, for a detailed but concise description of models and how they are put together.

daries of the methods used. And vice-versa, the choice of method is usually joined to the nature of the problem and its boundaries. The choice of method is determined by what is available in information, the goal of the analysis, and existing resources and help aids. Therefore, the information that a future study can give should be related to the needs that it should satisfy.

4.3 Future studies methodolgy.

The objective of this section is to present to the reader (1) some criteria for selecting a method(s) for a future study, and (2) a description of some of the commonly used methods which are used in future studies either singly or in combination.

(1) Some criteria for choosing a method for a future study:

It is important to look at the output side of the whole study process because the output, what will be done with the study's statements, should strongly influence the choice of inputs to the study.

There is not a fixed methodology that can be taught and propagated and that people can use in the same way that they learn multiplication tables. The techniques and methods used in future studies are, to a substantial degree, a function of (a) the problem, and (b) for whom the study is being made, and (c) the budget available for the study itself (Coates, 1974, p. 344).

The combining of methods and even choice of method is "in part a function of taste, in part a function of the comfort and inclination of the investigators, and in part a function of goals for the study" (Coates, 1974, p. 356). Coates goes on to state, "The goal of [a] technology assessment [or future study] is less the conventional scientific one of nailing down the facts, or testing a theory, than it is developing a degree of public wisdom."

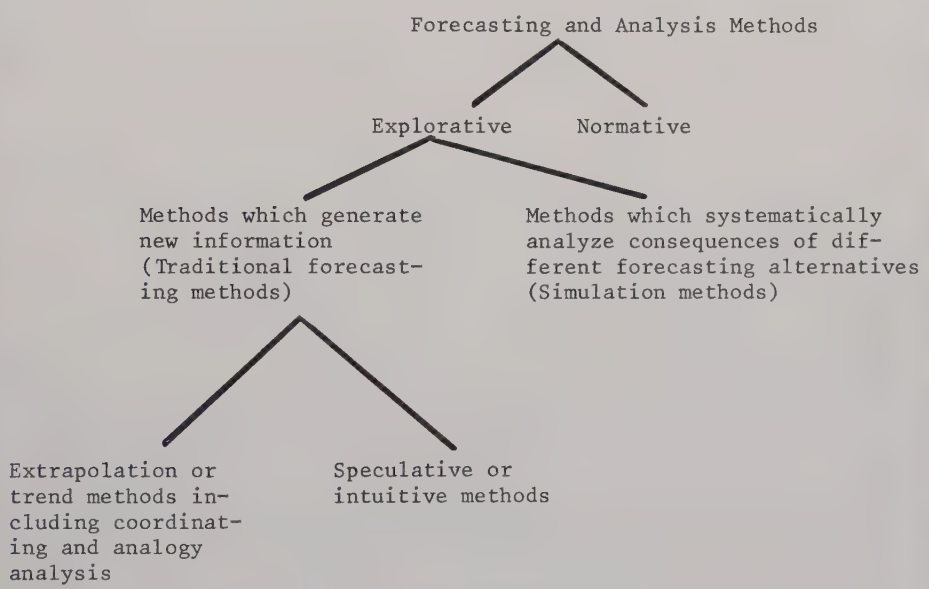
Forecasts of a changing world will alert management to potential threats and opportunities affecting or available to its business, enabling management to act or defer action relative to such threats or opportunities (Swager, 1972, p. 151). The best techniques to use depends upon the circumstances under which the forecaster is working; "his needs; the reliability, completeness and quantitative precision of the data base; the purpose of the forecast; the length of the forecast period; and the time available for

generating the forecast." Furthermore, the technique used should be adapted to and be compatible with the information available (Cetron and Monohon, 1968, p. 151).

The concept "forecast" itself can be used with different meanings. Jantsch (1967, p. 15) states, "A forecast is a probabilistic statement [i.e., 80% probability of rain as in weather forecasting], on a relatively high confidence level, about the future."

Figure 11 shows an overview classification of forecasting and analysis methods (see Jantsch, 1972, p. 80). Its emphasis is on what he calls explorative methods.

Figure 11. Overview classification of forecasting and analysis methods.


Forecasting and Analysis Methods
Explorative
Normative
Methods which generate new information (Traditional forecasting methods)
Methods which systematically analyze consequences of different forecasting alternatives (Simulation methods)
Extrapolation or trend methods including coordinating and analogy analysis
Speculative or intuitive methods

Source: Jantsch, 1972, p. 80.

On the next level Jantsch compares real forecasting methods (those generating new information) and analysis methods (those which systematically treat the consequences of existing forecasts).

Real forecasting methods can be broken down into trend and intuitive methods. Trend methods include trend curves of different kinds of coordinating and analogy analysis. These methods look at a relatively bounded number of influencing variables. They are built up on explicit models that can be formulated in mathematical terms. The coordinates as given in the models often are based on statistical analysis of historical material.

The group of intuitive and speculative methods contain methods based on real guesswork such as utopia creation and science fiction but also underlying experts' judgments as in Delphi, which is an intuitive method.

In practice there is not such a clear distinction between trend and intuitive methods. Judgments usually have a starting point of a systematic analysis of the underlying variables and consideration is given to certain qualitative variables' influences.

A summary of the working steps that should be undergone when making a comprehensive (environmental) forecast is shown in Figure 12. It emphasizes the importance of starting from the information needs of the decision makers.

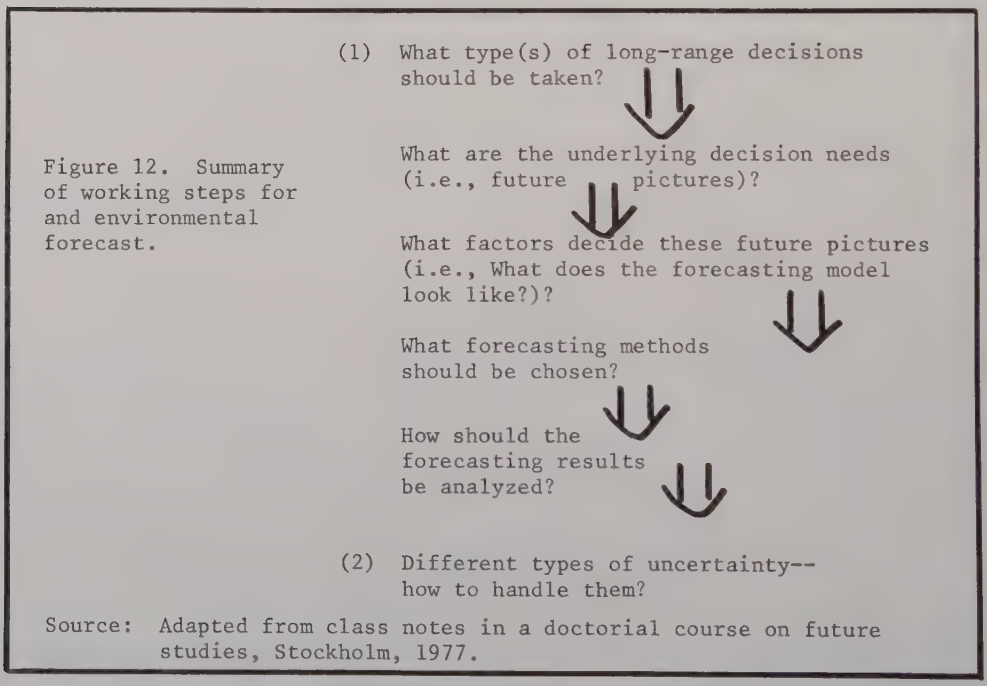

(1) What type(s) of long-range decisions should be taken?
What are the underlying decision needs (i.e., future pictures)?
What factors decide these future pictures (i.e., What does the forecasting model look like?)?
What forecasting methods should be chosen?
How should the forecasting results be analyzed?
(2) Different types of uncertainty-- how to handle them?

Figure 12. Summary of working steps for and environmental forecast.

Source: Adapted from class notes in a doctorial course on future studies, Stockholm, 1977.

A good forecast integrates existing information in an efficient way to be able to arrive at future outcomes. The uncertainties as to the efficien-

cy of the method concern two questions: Is the forecasting model a good one? (Does it include all of the important variables and relations?) What is the quality of the data being put into the model?

An example of this can be taken from Wikström (1973, pp. 46-47) where she presents a model showing what will happen is influenced by different factors. Her model is a very general one but she is discussing it in relation to a complicated forecasting situation in which it is not possible to limit the model to a few well-specified relationships. I have translated her presentation of the model below:

"'Let p^T represent a random forecasting variable in the real system with a future time point T such that

$$p^T = F^T_{to} \left(TM_t, R_t, a_{it} \right)$$

where TM_t = the influences the forecasting variable [technology, economic, social, political, etc.] are exposed to in the surrounding environment at time t,

R_t = the influences coming from steering measures (strategies) taken from society's side with time t,

a_{it} = the sum of the influences the forecasting variables are exposed to from different components and elements in the system (for example, other forecasting variables with time t),

and where F is explained below.'

'It has been assumed that between two time points, the starting point t_o and a future time point T, there are a flow of influences between the forecasting variables and the above factors. The influencing flows are in both directions but cannot be specified in detail. This has been formulated as function (F). It is not possible to actually quantify these influences. It is a question about circumstances which are complex and therefore difficult to get knowledge about or even to describe adequately. This forecasting formula merely gives a functional view of the relationships.'

'The above expression gives a future state for the forecasting variable. It answers the question of development lapse, a number of different states that are present, and the influences of the variables under the preceeding time period (from t_o to T). By studying the influences on the variables' developments, further time points (i.e., in the future) can be forecast.'"

Wikström (1973, p. 47) agrees that this is a very crude model. It does not attempt to give a detailed picture of which different influences there are questions about (positive or negative) or how strong they are. All variables are posted for multiple influences--some will influence in one direction, others in another. For this reason, large parts of the model in her case took the form of a "black box". The real forecasting process was built up on estimates of an intuitive nature, which is usual in such situations (Wikström, 1973, p. 48).

Again, a method has to be chosen by its relation to the problem type--the more singular the problem is, the more formalized methods and models to be used. The more complex the forecasting situation is, the more weight must be given to intuitive methods. This can be seen in Figure 13 which shows different techniques and uses for generating knowledge.

Figure 13. Different techniques to generate new knowledge.

1. A person sketches a future happening or state -----> scenario.
2. A person makes a systematic analysis, a step by step problem cutting -----> morphological attack -----> new combination of outcomes.
3. A number of experts discussing together -----> certain agreements.
4. A number of persons get together to brainstorm -----> new happenings and outcomes.
5. Systematic asking of a number of experts in different steps -----> agreements and diverging opinions.

Source: Adapted from class notes in a doctorial course in future studies, Stockholm, 1977.

Therefore, in evaluating environmental factors, the following steps should be undertaken for each variable:

- Primary effects--potential, performance, time perspective, size, changes early or not, information spread, etc.;
- Secondary effects--internal effects, working environment, use of resources, opinions of effects, environmental effects (phy-

sical, environmental, economic, social, etc.;
- Alternative possibilities--developing lines, applications, etc.;
- Projecting towards....; and
- Decisions (choices between alternatives).

In summary, the criteria for choosing a method depends upon what kind of output is needed as there is no one method for all problems. The precision of models may have to be exchanged for creativity and overview. Methods may be combined in many ways.

(2) Description of some of the methods commonly used in future studies:

The second stage in the forecasting process is to choose methods to get data with and to put that data in the overall model on the different variables.

As just mentioned there is no single method for doing this or for carrying out a study. A study requires an appropriate mix of methods and techniques drawn from a variety of fields and much of the important work of the researcher is creative and cannot be programmed. "The appropriate mix of methods to use, the variables to be selected, the units of measurement to employ, and the sequence of tasks must remain a function of the problem at hand and the experience and creative imagination of the principal investigator(s)" (Roessner and Frey, 1974, p. 163).

Coates (1974, pp. 348-355) discusses some of the more common methods that could be used singly or in combination for carrying out a future study with. This is not an exhaustive list that I have summarized on the following pages--but is merely a summary of some of the choices available for consideration in the early stages of structuring a future study. I have elaborated on Delphi technique and scenario writing as they pertain more directly to my own study than some of the other methods but have listed where additional references can be found for each method.

Brainstorming (Coates, 1974, p. 354): A structured and unstructured exercise for the free-flowing generation of ideas is central to any individual or team activity working with a complex problem. (See also Jantsch, 1967, pp. 136-137.)

Decision and Relevance Trees (Coates, 1974, p. 351): These related methods of exhaustion attempt to develop all possible options and alternatives. The branches are critical decisions which exclude other major options. (See also Jantsch, 1967, pp. 219-233.)

Decision Theory (Coates, 1974, p. 354): A means of quantifying alternatives for the decision maker. (See also Jantsch, 1967, pp. 215-218; and Cohen and Cyert, 1975.)

Delphi (Coates, 1974, pp. 348-349): Traditional Delphi aimed at concensus forecasting attempting to improve the utilization of experts in analysis, evaluation, and forecasting by using a format different from that in committee meetings. A simple form of Delphi would be a carefully designed series of individual interrogations (usually conducted by questionnaires) and opinion feedback. It is generally applicable to any situation to which quantitative values may be assigned (i.e., dates, weightings, scalings, etc.). (See also Jantsch, 1967, pp. 137-140; Linstone and Turoff, 1975; Wikström, 1973; and Helmer, 1968, pp. 116-122.)

Delphi was originally used for forecasting purposes (but during the last decade has spread to other areas of inquiry) and originated as a method for eliciting expert opinion through a structured communication process (Schwarz, et. al., 1980, p. 11).

The most common form of Delphi (conventional Delphi) involves a "monitor team that explores the problem area and designs a questionnaire which is sent to a panel, often a group of experts that the team has selected. The monitor team summarizes the results of the responses and develops a new questionnaire for the group of experts. The experts are usually given at least one opportunity to reevaluate their original answers based upon examination of the group response. This is often given an average value with some measure of dispersion. Emphasis is on anonymity, i.e. the responses of each expert is not communicated to the other experts or publicized" (Schwarz, et. al., 1980, p. 11).

Earlier forms of Delphi usually aimed at a concensus among the experts. Delphi technique no longer necessarily aims at a concensus and has been used to explore differences in opinion between various groups of people. (Schwarz, et. al., 1980, p. 11)

There has been quite a bit of criticism of Delphi technique. Most widely known is Sackman's (1975) report which criticizes it for being less rigorous than other questionnaire techniques. But his comments could apply to any questionnaire and interviewing method and not just to Delphi. Future researchers, nonetheless, have expressed the view that it is "a method of last resort" which can be considered when there are no other methods available or when other methods would be too expensive (Coates, 1974).

Linstone and Turoff (1975, p. 4) state that it is not the explicit application of the future study which determines the appropriateness of selecting Delphi. Rather, "it is the particular circumstances surrounding the necessarily associated group communication process." They go on the state that it is usually one of the following reasons which leads to the need of using Delphi:

- The problem doesn't lend itself very easily to precise analytical techniques but can benefit from subjective judgments on a collective basis.
- The individuals that are needed to contribute to the examination of a broad or complex problem do not have a record of sufficient communication to work with. They may also represent diverse backgrounds relating to experience and proficiency.
- More individuals are needed than can effectively interact on a face-to-face basis.
- Frequent group meetings are not appropriate due to time and cost constraints.
- Face-to-face meetings can be improved in efficiency by additional group communication processes.
- Disagreements among individuals are so great or so politically divergent that the communication process must be referred elsewhere and/or anonymity assured.
- The heterogeneity of the participants must be preserved to assure validity of the results and avoid the domination of single personalities or domination by sheer numbers alone (i.e., a "bandwagon effect").

While Delphi played an important role in the beginning stages of the emergence of future studies, "it is by no means the dominate tool of the futurists" (Schwarz, et. al., 1980, p. 13).

But one "interesting aspect of Delphi is that it addresses a central issue in futures studies, namely the need for eliciting often quite vague forms of knowledge from a variety of people" (Schwarz, et. al., 1980, p. 13).

My 'modified' Delphi study may fall outside the traditional Delphi description. But it has used some of the basic ideas of the original Delphi method (i.e., eliciting expert opinion by a structured communication pro-

cess in a number of rounds, anonymity, etc.) and also utilizes some of the newer ways of thinking about and using Delphi technique (i.e., exploring differences in opinion between various groups of people) without being built into a complete Delphi study. What I have done in my study is to use Delphi as a means for gathering data which will be discussed in depth in Chapter 5.

Economic Techniques (Coates, 1974, pp. 351-352): Any technique of economics has its place (i.e., input-output, cost-benefit, etc.) even if they do not add new information to the forecast but are used to translate estimates into economic terms compatible with the economic environment in which the impact is first felt. (See also Jantsch, 1967, pp. 190-200.)

Judgment Methods (Coates, 1974, p. 355): Why do people judge a matter the way they do? What policies do they really follow in a complex situation? Here a set of questions are asked involving different choices. By analyzing the responses to the questions, the weightings assigned to each of the underlying components is determined. You get the feedback from the experts' judgment so you can quickly "home in on" making the same kind of judgments. (See also de Bono, 1978; and de Bono, 1969.)

Modeling (Coates, 1974, pp. 352-353): A more general category than simulation (see Meadows, et. al., The Limits to Growth, 1972 or Forrester, World Dynamics, 1971) using mathematical models. Physical modeling could also be used.

Morphological Analysis (Coates, 1974, pp. 350-351): A method of exhaustive search for effects dependent upon asking a series of questions about a technological development, the set of questions being exhaustive of all possible questions one could ask about the technology, for example. A full-range of all potential answers to each question is also provided. One then proceeds with a morphological analysis in systematically selecting all the permuted combinations of the answers to each question, obviously eliminating the many combinations that are incompatible or unrealizeable. (See also Jantsch, 1967, pp. 174-180.)

Participation Techniques (Coates, 1974, p. 354): The need for interested parties to understand the complexities and subtleties of a technology, etc. Related to this would be a variety of sensitization techniques in which the principal value is to bring about mind changing to broaden the participants' outlook on the complexity of the problem at hand. Also as to the needs of bringing in new issues.

Scenarios (Coates, 1974, p. 353): Scenarios are mainly the attempt to

systematically develop complex statements for exploring future developments and implications of future world states. (See also Jantsch, 1967, pp. 180-181, 200-204, 235-239; Wikström, 1977(b), pp. 9-11; Wikström, 1977(a), pp. 63-66; Cazes, 1976, pp. 405-410; Rhyne, 1974, pp. 133-162; Schwarz, et. al., 1980, pp. 23-30; Kahn, et. al., 1977; and Widman, 1980.)

Jantsch (1967, p. 180) defines scenario writing as "a technique which attempts to set up a logical sequence of events in order to show how, starting from the present (or any other given) situation a future state might evolve step by step. The purpose is not to predict the future. [It is] a synoptic view of as many developments as can be grasped as may appear relevant to an experimental simulation of a possible reality. Herman Kahn emphasizes in his 'On Alternative World Futures: Issues and Themes", Hudson Institute, N. Y., 1965 that 'the scenario is particularly suited to dealing with several aspects of a problem more or less simultaneously. By use of a relatively extensive scenario, the analyst may be able to get a 'feel' for events and the branching points dependent upon critical choices. These branches can then be explored more or less systematically.' Scenarios, [Kahn] goes on to state, force one 'to plunge into the future by dramatizing and illustrating the possibilities they focus on' and also 'force the analyst to deal with details and dynamics which he might easily avoid treating if he restricted himself to absract considerations'" (Jantsch, 1967, pp. 180-181).

Jantsch continues to state that "Kahn himself warns of the dangers that may arise from the use of scenarios to guide and facilitate further thinking and analysis. Specifically, the initial conjectures might erroneously be assumed to be sufficiently correct to lead to scenarios with some content of 'reality'. However, ..., 'a specific estimate, conjecture, or context, even if it is later shown to have serious defects, is often better than a deliberate blank which tends to stop thought and research' (Jantsch, 1967, p. 181).

Scenarios are considered to be be one of the main tools of future studies by many doing future research. Wikström states they can be used for collecting data, analyzing data, and for the presentation of the results. As an analysis method they can be used for putting forecast parts together into a whole. As a method for presenting forecasting results they can be used by putting together different forecasting methods.

Rivett (1979) states a scenario is said to be "a qualitative or quantitative description of the world at a particular future time. The scenario describes scene by scene one or more mental images of the future and for the

method to be informative it is important that these images be detached, self-consistent and real." He goes on to describe several methods for writing scenarios such as the example below:

"One writes a description of the world as it might be in the year 2000 and then from the perspective of the year 2000 the history of the previous 25 years is written. In this history, which would take us from the known of 1975 to the suggested world of 2000, one can identify critical points of change in the world which lead to the culmination of the particular history described for the year 2000. By analyzing such 'historical' documents one gains an understanding of the events which might have to occur for particular scenarios to obtain in reality. Attention can then be focused on the likelihood of these events occurring and hence on the likelihood of the particular scenario being evolved."

Schwarz, et. al. (1980, p. 27) state that the use of the term scenario in connection with future studies may have a number of quite different meanings and may be used to denote a description of (for instance): (1) A hypothetical, likely or unlikely, development or situation. (2) A development which is described as to some extent caused by the actions and reactions of various actors. (3) A desirable or nondesirable development or situation.

Schwarz, et. al. (1980, p. 29) go on to state that as "the term scenario is nowadays used in such a variety of different meanings it has become rather unusable for methodological discussions in future studies. For instance we can hardly compare pros and cons for applying Delphi, scenarios, mathematical models, [etc.] in a specific futures study when the term scenario may more or less include all approaches in futures studies. It therefore seems necessary to explicity refer to the set of methodological ideas which are considered instead of just using the term scenario."

Schwarz, et. al. (1980, p. 26) quote, "'Scenarios are (or should be) multifaceted and holistic in their approach to the future. In the early days of futures research, and still to a great extent in popular literature, it is the isolated event, the specific prediction that rivets attention. However, history is a 'booming buzzing confusion' of events, trends and discontinuities; it is constantly in motion and so is more accurately represented by a motion picture than by a snapshot. Scenarios have a special ability to represent this multifacet, interacting flow process, combining (when appropriate) demographic changes, social trends, political events, economic variables, and technological developments.'"

"If a scenario is nothing but a verbal description of some hypothetical

future development, how could it be considered as a method?" (Schwarz, et. al., 1980, p. 28) When the use of scenarios is presented as a method, it usually implicitly refers to the application of some but not necessarily or simultaneously all of the following methodological ideas (Schwarz, et. al., 1980, pp. 28-29):

" a) We cannot predict the future but by designing a number of plausible and consistent descriptions of hypothetical future developments or situations (scenarios) we can define an uncertainty space to take into account when studying the problem at hand.

b) If we want to anticipate problems and improve our future situation we should not just assume that present trends will continue but design desirable futures (scenarios), identify branching-points and mechanisms of change so as to find actions which can affect the development in a desirable direction.

c) If we are concerned with the future development of a specific system of planning object (e.g. a business firm, the energy system, etc.) it is useful to make explicit assumptions (scenarios) about the future development of the environment of the system (otherwise no change at all is often implicitly assumed).

d) It may be useful to try to synthesize fragmented, dispersed and sometimes vague knowledge into a holistic and consistent picture (scenario) of a future development or situation. This is specifically important when there are considerable cross-impact effects between the developments in various fields which cannot be taken account of if they are considered separately.

e) To get a realistic picture of possible future developments in an area where discontinuities and changing trends may emerge as the result of specific events and actions it can be useful to try to describe a number of hypothetical developments as partly resulting from the decisions and actions of various actors.

f) There are future developments which we consider unlikely but dangerous. By making an effort to imagine in some detail how such developments might emerge we might be able to make preparations which will make such developments less probable or less dangerous."

When a reference is made to the "scenario method", it may mean one of the applications above as well as/or some specific methodology for developing scenarios. For example, Rhyne (1974, pp. 133-162) proposes a methodology for creating alternative whole futures (scenarios); Cazes (1976, pp. 405-410) suggests a model for creating alternative futures (scenarios) by combining for each function the pair of parameters which characterizes them; and, Wikström (1977[a], pp. 63-66) presents an analysis of various situa-

tions and how they are affected by different futures.

Simulation (Coates, 1974, p. 352): The application of mathematical techniques to the simulation of a physical system (i.e., traffic flows, etc.).

Structuring the Problem (Coates, 1974, p. 350): Using methods of exhaustion of impacts or consequences based on experience which provide checklists against which one can systematically search out new impacts or consequences. (See also Watson, 1978, pp. 165-185.)

Survey Techniques (Coates, 1974, p. 354): A central tool in understanding public views on many issues. (See also Sonquist and Dunkelberg, 1977.)

Systems Analysis (Coates, 1974, p. 352): Coates quotes Blumstein (1967) as saying, "A systems analysis focuses successively on:

1. A particular system--a collection of people, devices, and procedures intended to perform some function.
2. The function of the system--the job it is supposed to perform.
3. Measures of effectiveness by which one can measure or calculate how well alternative system designs perform the function.
4. Alternative system designs to be compared.
5. A mathematical model with which one can calculate the measures of effectiveness associated with each alternative system design."

(See also Jantsch, 1967, pp. 239-240; Ackoff, 1971, pp. 661-671; Kahalas, 1977, pp. 78-82; M'Pherson, 1974, pp. 219-239; Hare, 1967; and Churchman, 1971.)

Trend Extrapolation (Coates, 1974, p. 350): Used as a guide to the analysis of present trends as well as a clue as to what kinds of normative judgments should be made. Normative forecasting refers to goal related predictions in which the forecast is premised upon the identification of activities required to achieve a particular goal. (See Jantsch, 1967, pp. 144-168; Beckwith, 1967, pp. 9-15; and Schwarz, et. al., 1980, pp. 15-22.)

The above listing was just a sample--the possibilities are endless. Chapter 5 of this report will elaborate on the specific needs of my future study based on the material and information I've presented in the four sections of this chapter: (1) Choosing a forecasting model, (2) gathering my

data and method used, (3) analyzing my data, and (4) presenting my results. But before I discuss these central problem areas of carrying out my own study, it might be useful to present some criteria for evaluating a future study. This is presented in the last section of this chapter.

4.4 Future studies evaluated.

This section attempts to identify what criteria as found in the literature of future studies (and elsewhere) that there are for evaluating a future study.

I will not discuss here what it means to be scientific nor discuss when scientific procedures are appropriate, but it is essential to mention that no study of the future can be fully "scientific, in any strict sense of the word.

de Houghton (1971, p. 33) states, "Scientific method is to do with the generation of hypotheses, the collection of relevant data and the comparison of hypotheses with data. It still remains to be seen how far these traditional procedures of science may be applied to future studies. At the moment, all we can say is that a very great deal of uncertainty surround the application of the first two and that that of the third--the comparison of hypotheses with the 'reality' represented by future data--is, by definition impossible. Thus, although many of the techniques ... rely increasingly upon 'scientific' method, we can confidently state that the study of the future, at least until the invention of the time machine, will remain an 'art'."

de Houghton goes on to state that, "Medicine, despite all the science that goes into it, is often referred to as an art, more especially by its practitioners than by their patients. But that does not deter the sick from consulting their doctors, listening to their advice and submitting to their inevitably fallible prescriptions. Some of them even get cured" (1971, p. 33).

It should be noted, also, that there are other opinions of what the scientific method is, other than the positivistic paradigm. For instance, science can be seen as a contribution to knowledge in its own right, too.

Linstone (1977, p. 7) states that there are several traps of the scientific heritage: The search for a "best" solution to a problem, the drive for quantification, and to find "the most satisfactory" model. "If the sys-

tem cannot be solved, it is compartmented and each subsystem is analyzed and optimized. The result is a series of beautiful (and publishable) subsystem solutions which often constitute a very poor solution to the total system" (Linstone, 1977, p. 8). He further says on this same page that "If the model is unsatisfactory, the proposed cure involves the introduction of more variables, alteration of the relationships, and development of a more comprehensive version. And model complexity is confused with holism. Analysis of a system in terms of many elements and interactions does not constitute a holistic view of the system."

Hoos (1974, p. 113) states,

> "Unorthodox though it may seem, ..., that, given the present-state-of-the-art of 'futures research,' the classic example of the Greek sibylis (i.e., deliberate ambiguity) may be the most desirable. As for criteria for 'good futures research,' there are none identifiable now; it is doubtful that there can be any; it might be better for the future if there were none. Using veracity and accuracy as possible criteria, one explores the past and finds considerable lack of agreement among historians and histographers. Current sources of information are then scrutinized, and although there is no dearth of data, reliability as to source and interpretation is generally suspect, in both the public and private sector. As for the future, technological and social forecasting are still paper-and-pencil games, with the outcome only as good as the forecasters. This puts the onus on the professional 'futurologists,' whose credibility and credentials are yet to be established."

Hoos states some of the crucial points to keep in mind when looking at the results of a future study which is usually built upon a dearth of reliable data which is just the opposite of what good research is built upon. She contends that the information base, how it is derived and used and by whom, is critically important in understanding social processes, whatever their time frame, past, present or future (1974, p. 114).

(1) History and "Facts": "If accuracy be the criterion, then even past and present are subject to interpretation" (Hoos, 1974, p. 114). The facts are decided by the historian as to which get the floor. The "almost fanatic reliance on data points up to a faith not justified, an attribution of reliability more wishful than real; or it may perhaps be a conscious, cynical trade-off on the assumption that anything is better than nothing" (Hoos, 1974, p. 116).

(2) Data, Documentation and the Research Function: Whatever techniques are used for the forecasting of a future study, much will depend on the re-

liability of the data on the past and present. "The past, ..., is a vast and rich reservoir in which fact turns out to be a fishing expedition" (Hoos, 1974, p. 116). This criterion includes all the statistical sources --how valid are they? Who collects them? How are the compiled? When updated? For what purpose are they collected in the first place? Etc.?

(3) Futures Research--Prolegomena and Perspectives: This seemed to be the "bandwagon" for the 1970s. "A particular favorite appears to be science and technology forecasting, perhaps because these are relatively less complicated by human, social, and political vagaries" (Hoos, 1974, p. 124).

She says, "If our forecasting techniques for technology were so weak ... that the triumph of aircraft, 'the King of the Fleet,' the 747 jumbo jet that caused airports to relocate and rebuild their facilities, almost overnight could become the dinosaur of the Jet Age because it requires 40,000 gallons of fuel for every hour it flies, ...--if not a glimmer of ... important occurrences appeared in the crystal balls of the forecasters, can we count on them to foretell with any degree of credibility the future of man's social world?" (1974, p. 127).

For the answer she states the methods and tools in use must be looked at, then at the record, and finally at the forecasters themselves. For instance, the systems approach attacks the future very similarly to the way it deals with the present. "Possessed with the zeal to appear scientific, the futurologists have gratefully glomerated fragments of borrowed methods in an eclectism that bespeaks the lack of an intrinsic discipline" (Hoos, 1974, p. 127).

But to use a systems approach to analyze current phenomena the main difficulty has been to establish a data base. How does one determine the indicators that one bases the prediction upon? Fuzzy conceptualization and fuzzy assumptions are usually made. "'The very labeling of data as 'social indicators,' with the normative implications which labeling carries, may be misleading in its implications. Indeed, the omission of items which cannot be measured is itself a major bias--often the most important facts about social conditions are qualitative, derivative, or interactive'" (Hoos, 1974, p. 129). She states, "One might also add, with an amen to the above, that not facts but issues, the whole complex cancatenation of social topological relationships, might be more meaningful as indicators than the mere countable dribs and drabs to be captured in the accountant's holey sieve. But since ideas, much like spurious figures, become legitimated by reference and repetition, the notion of social indicators [used as an example] has managed to attain such an aura of respectibility....' (Hoos, 1974, p. 129)

The last thing to consider--who are the people doing the future studies? "'There are two occupations ... for which previous experience is not necessary. One is streetwalking, and the other is systems analysis.' Such is the terrible state of the futuribles" (Hoos, 1974, p. 129). "If accuracy is a criterion for prediction, then who the futurologist is, what he stands for, what are his values, become crucial. Intrinsic in the matter of being right is the now-familiar and generally recognized element of the self-fulfilling propensity" (Hoos, 1974, p. 130).

In 1977 Hoos wrote another article--an "encore of devastation" posing the same question: Is it possible to study the future rationally and scientifically? She examines the methods now in use and still finds the assumptions shaky and the tools with faults and the implications dangerous. "With data as the driver, analysis the watchword, quantification the rule, and model-building the prime pre-occupation, futurology rests heavily on the two key pillars, the information base and cost/benefit calculations. Because these are shown to rest on quicksand, the elaborate methodological structure based on them totters precariously" (Hoos, 1977, p. 335).

T. S. Eliot said, "All knowledge brings us closer to ignorance." Hoos states, "Certainly, we will have to acknowledge that we do not know the truth, the whole truth, and even invoking the diety will not help us overcome the gaps and deficiencies. To presume, then that we have the techniques and tools to study the future is to delude ourselves, perhaps to the point of disaster if we depend on this methodology for accurate forecasts and for risk assessments of things to come" (1977, p. 343).

Depending upon the researcher's background and objectives, he will emphasize different aspects.

There are several different schemes for attempting to sort out different perspectives. Linstone (1977, pp. 9-10) presents Churchman's five inquiring systems:

- Lockean: Agreement on observations or data--i.e., empirical.
- Leibnizian: Formal model providing theoretical explanation.
- Kantian: Theoretical model and empirical data complement each other and are inseparable.
- Hegelian: Dialectic confrontation between opposing models or plans leading to resolution.
- Singerian: Pragmatic meta-inquiring system including application of all other inquiring systems as needed.

Linstone states (1977, p. 10) that "clearly the emphasis of forecasters has been on the first (Lockean) inquiring system, which leads directly to trend extrapolation--by far the most popular forecasting too."

"Using Jung's psychological type classification we begin to recognize the significant differences among individuals in their thinking about time --clearly a vital aspect in their approach to future research" (Linstone, 1977, p. 10):

Jung Type	Time Orientation	Approach to Futures
Sensation	Present	Discounting
Felling	Past	Exploratory (trend extrapolation)
Intuition	Future	Normative (utopian, goal setter)
Thinking	Past-present-future	Cybernetic (feedback between exploratory and normative)

"According to Jung, individuals can take in data from the outside world by either sensation or intuition but not by both simultaneously.... Sensation refers to those individuals who typically take in information via the senses, who are most comfortable when attending to the details of any situation, and who prefer concrete, specific facts. In contrast, intuition refers to those individuals who typically take in information by means of their imagination, by seeing the whole--the gestalt--of any situation. These individuals typically prefer the hypothetical possibilities in any situation to the 'actual' facts" (Mitroff and Kilman, 1975, p. 164).

Also, "according to Jung, there are two basic ways of reaching a decision: thinking and feeling. Thinking is the process of reaching a decision that is based on impersonal, analytical modes of reasoning. Feeling on the other hand is the process of a reaching of a decision that is based on personalistic, value judgments that may be highly unique to the particular individual" (Mitroff and Kilman, 1975, p. 164).

"Combining the two data input modes (sensation and intuition) with the two decision making modes (feeling and thinking) in all possible ways results in the following four Jungian Personality types" (Mitroff and Kilman, 1975, p. 164):

(1) sensation-thinking (ST),
(2) sensation-feeling (SF),
(3) intuition-thinking (IF), and
(4) intuition-feeling (IF).

Mitroff and Kilman state. "The emphasis of ST approaches in on impersonal criteria, specificity, control, precision, rigor and an attitude of reductionism" (1975, p. 168) ST is discipline-oriented. IF emphasizes that problems cannot be broken down into neat clean steps before hand. It is a highly personal affair: Interdisciplinary, concerned with ill-defined problems and is guided by intuitive and subjective thought processes.

Zaltman, et. al. (1973, p. 93) state: "A philosopher of science will certainly put emphasis on such properties as logicalness, consistency, rigor, validity, quantitativeness, precision; a statistician, on predictivity, representativeness, standardization; a social scientist, on insight, explanatory power, experimentability, predictivity, objectivity; a practitioner, on applicability, familiarity, flexibility, fruitfulness, practicality, utility; and so forth. Consequently, ... there is no 'absolute' and 'perfect' hierarchy of evaluation criteria." There isn't a scientific way of evaluating as an hierarchy would be dependent upon context. Zaltman, et. al. (1973, p. 93) state further, "Our observation can be understood as a corollary of the belief held by most philosophers of science and social scientists that there is a myth of the scientific method."

Zaltman, et. al. (1973, pp. 160-171) propose the following criteria for evaluating predictions:

(1) Confirmability (whether it is possible to assign a truth value to it).

(2) Scope (refers to the range of events it covers).

(3) Precision (refers to the degree of specification of the events or variables involved and the relationships between those events or variables).

(4) Accuracy (the frequency with which factors not included in the prediction interfere with the predicted phenomenon--that is, cause it not to happen exactly as predicted).

(5) Power (the more precise and encompassing of variables a predictive explanation is, the more powerful it is).

Cetron and Monohan (1968, p. 151) state, "The major requisites of good forecasting can be reduced to: (1) a reliable data base, which normally consists of the knowledge of scientific and technical specialists in the subject matter area as well as any supporting data; (2) astute judgment and common sense on the part of the forecaster; and (3) an understanding of available forecasting techniques and how and when to apply them."

But it must be kept in mind that a future study's "greatest value lies

not so much in it accuracy, but in its contribution to planning strategies" (Jantsch, 1967, p. 99).

In summary it needs to be emphasized that there are:

(1) No traditional criteria of scientific reasearch which can be used in evaluating a future study.

(2) The value of a future study mainly lies in its contribution to planning. Criteria for evaluating forecasts can only be partly used.

(3) The procedures used in the gathering of data and analysis may be evaluated but that gives only part of the picture.

(4) The personality (experience and knowledge) of the researcher are important. Some succeed, some don't.

Chapter 5 of this study will incorporate a personal critique on what I have done as I discuss the central problem areas I encountered in carrying out my study. Chapter 6 will briefly evaluate what I have done as a whole.

5. Problem Areas of Carrying Out the Study

As stated in Chapter 1, this study will: (1) Identify and describe some of the internal and external variables affecting current problems in the insurance industry generally and in the airline insurance sector specifically; and (2) make projections of their consequences to the year 1990 to see what possibilities the future might offer to solve these problems.

The starting point for the reader is a description of the present state of the industry as discussed in Chapter 2 of the industry background description of this report. Input comes from interviews with key decision makers in the industry, my own thinking based on literature describing different aspects of the industry--generally, and specifically airline--and comparisons with other markets where possible.

In Chapter 1, Figure 2--Research approach to this study--I have shown the four main interview stages or steps and what was contained in each: The goal or objective for each interview step, the methodology used to achieve that goal, the output, and what I did with the output before I went on to the next step. This scheme follows closely the typical steps contained in any research project using methods basic to research in a wide range of fields. It has been adapted from Joselyn's Designing the Marketing Research Project (1977) and is basically what I have used to structure the steps in my fieldwork and design of my study along with the methodological background contained in Chapter 4 of this report.

This chapter presents what I actually did (or rather, as well as I am able to tell what I did). It is divided into the five central problem areas of the study from a methodological standpoint: (1) Problem indentification, (2) choice of forecasting model, (3) gathering of data, (4) analysis of data collected, and (5) transferring of data into scenarios.

But before I proceed to discuss the central problems of this study in the steps of its development and execution, it might be interesting to the reader to know why I have chosen airline insurance in the first place for this study.

The criteria for the selection of an industry for this project was: (1) An industry completely unknown to me at the beginning of its design, (2) complex, (3) international and global, and (4) having a lengthy period of troubled times. The insurance industry met these criteria admirably. The banking industry was the alternative contender for this project. (Note: These criteria have been selected arbitrarily to meet my idea of what would be a good test for the design and implementation of an industrial future study and also still be interesting to me personally.)

The airline insurance sector was specifically chosen as the focus for this study because (1) I am interested in aviation, (2) the airline sector generates the highest premium volume within the aviation area, (3) I had hoped data would be relatively easy to come by--but as later turned out, this did not prove to be true, and (4) future studies have not previously been done in this area.

Why a future study? My interest in future studies stems from a variety of things--the quickened pace of change and the diminishing of natural resources, to name a few. Also, management generally remains preoccupied with the short-term and regards long-term thinking as a luxury if necessary at all. The richer a company is the more likely it will "indulge" in long-range planning. A future study should be as useful to a company in depressed times as in prosperous ones, if not more so. The future is plastic, human beings (and companies) are not moving towards a predetermined future world but, instead, are active participants in the creation of the future world.

How useful would such a study be? A needs analysis provides the justification for proceeding further with the expenditure of time, effort, etc. The needs must be of sufficient importance to expend the effort even in the very early stages of problem definition. Therefore, as environmental variables affect all industries universally, an example from the insurance industry of a complex international industry would be meaningful to show environmental changes and their consequences over time to a wide range of readers. I decided there would be sufficient interest (both to me and potential readers) in such a study to proceed ahead.

5.1 Problem identification.

The main problem has been to identify just what are the problems. To do this, I had a continuous feedback going with reality. I was searching as

much for variables as for problems. Problem definition appeared during the preliminary research stage of the project design.

What are the real problems in the industry? There was a problem in defining what the problems were. The different steps in the research process were carried out simultaenously: Problem defining, variable hunting, methodology selecting, etc. Are declining profits, for instance, a symptom or a problem? The assumption that low profitability is merely a result of heavy competition might be a simplification of the reality--hence the searching for variables affecting the market or what lies behind the problems (symptoms) of the market today.

The problem areas of future studies tend to be open-ended. For instance, problems often do not fall directly within the area of responsibility of any existing administrative or policy-making unit but cross several boundaries. No specific boundaries have been stipulated in the research which means that all environmental variables will be and have been considered for the creation of the scenarios in a later stage. Future study problems tend to be interdisciplinary and the problem formulation may constitute the major part of the analysis with precise solutions seldom to be expected. Nonetheless, identifying general problems existing in the world-wide insurance industry was the starting point in my project development and is also the starting point for this study, so that the reader can see that those conditions, specific to the airline insurance sector, are not unique but part of a trend affecting the industry at large.

In trying to identify what the problems facing the industry were, I relied on the key decision makers' perceptions of what they think their problems are. That there is more business but less profit seemed to be on the lips of everyone. At least the insurers are convinced that this is true.

The problems common to the industry and the branch selected--airline--insurance were identified through a series of informal and unstructured preliminary discussions with knowledgable people in the airline and insurance industry in Stockholm and on the continent. These interviews were carried out over a period of two months in which I was not only directed to existing literature, but attended lectures and was lectured to on aviation and airline insurance to get me as quickly as possible to a working level of terminology and background to carry out the study I desired to do.

These sessions began with an explanation of my goals and very general questions progressing over time to more specific questions dealing particu-

larly with the issues facing the industry.

Exhibit I is a listing of many of the informal and unstructured questions asked during this first stage to formalize the project: To determine the scope of the problems as is the first step for every future study. Of course, the scope or boundary can be remade if need be. (This step assumes a prior step of problem-finding.)

Exhibit I. Some sample questions to the industry.[a]

Environmental Factors:

(factors/actors)
- What are the important factors and variables influencing this industry?
- What factors and actors affect the industry?
- How do these same factors affect the economic results of the business enterprise (internal goal fulfillment)?
- What is the relationship between the actors in the industry?
- What are the market forces controlling these relationships?
- What is the relationship between the actors and the regulators? How are they handled?
- How can this relationship and the weaknesses inherent in the demands by lack of measures to define and tools to control them, be analyzed to show how they influence the industry?
- What is the minimum level the actors in the industry must maintain to keep the system alive?

(changes)
- What are the environmental changes you expect?
- What new prerequisites will be created by these environmental changes?
- How shall the airlines be affected by the rapid changes of demand of the consumer?
- How can the industry adapt to these changes?

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[a] Questions brainstormed with initial insurance contacts. Some preliminary ideas also came from Wikström, 1973; and Ericsson and Wikström, 1970.

Exhibit I. Some sample questions to the industry (cont.)

(society)
- Societal point of view: Which demands are reasonable and possible to raise on the airline insurance industry in order to create as fine as possible a service?
- What is the social and societal function of the airline insurers?
- What is the social and societal function of the airlines?
- What are those demands connected with peoples health? With long-range welfare?
- How does societal behavior affect the airlines and the insurers?
- What does society demand the airlines provide?

(demands)
- How shall the airlines and insurers adapt to the different governmental authorities' demands?
- How can they clarify what these often ill-defined demands are?
- What is the sequence of events? Are demands made in detail or do authorities intervene afterwards and make adjustments when negative effects occur?
- What are the conflicts between the different societal and consumer demands (i.e., high quality vs. low price)?
- What sort of balancing should be done?
- Who are the different categories having different opinions on how the conflicts should be balanced?
- What is the conflict between the control activities of government authorities and their long-term effects and the airlines? What about the insurers?

(regulation)
- What is the largest sector in the environment controlling this industry?
- Who are the governmental authorities which control and regulate the behavior of the industry?
- What are the insurance regulatory bodies?
- How is the insurance industry regulated?
- What difficulties do the governmental authorities have in defining the terms?
- What difficulties do the governmental authorities have in defining the norms?

Exhibit I. Some sample questions to the industry (cont.)

Goals/Values:

(goals) - Who sets the overall goals for the industry?

- What is the insurers point of view? The airlines point of view?
- Should these (or are they) be clearly defined?

(planning) - How do the manufacturers plan? The airlines? The insurers?

- What commitments must each group make? Over what time period?

(decision making) - What decisions must each group make?

- Do these decisions agree with societal norms?
- What are the consequences of their decisions?

(demands) - How shall the insurers adapt to the changes of demands of the airlines?

- How can the industry maintain profitability when it adapts to new conditions?
- What are the difficulties defining demands on the various sectors presently?
- When demands are formulated, how can the effects on the industry be evaluated in the short-run?
- What do the airlines demand the insurers provide?
- What are the criteria surrounding these services?
- How well does the business and industry as a whole meet the societal goals and demands?
- What are the difficulties of the insurers, the airlines, and the regulators within the total system?

(evaluation) - What evaluation criteria should be used presently?

- What are the results or evaluation criteria to be specified?
- From what point of view are the results evaluated?
- What evaluation criteria should be used to define demands whichare valid in the future?
- What are the prerequisites of the industry in the future?

Exhibit I. Some sample questions to the industry (cont.)

Insurance:

(problems) - What are the main problems facing the airline insurance industry today?

- What are the main problems facing the insurance industry at large?

(centers/markets) - What does the airline insurance market include?

- What is the present capacity of the market?
- What role does London as a center play?
- What is the current state of the market?
- What are the largest aviation insurance firms?
- Who are the main players in each center?
- Does the United States have the capacity to assume its own risks?
- What are the alternative markets (alternative to London)?
- Will London continue as a center? Why not?
- What is the objective of the market?
- How long will the current buyers' market continue?

(underwriting) - What is the estimated market size for facultative and treaty underwriting?

- What techniques are used in the market?
- What determines which techniques will be used?
- How are insurance slips handled?

(rates) - How are premium rates determined in each center?

- What will the premium rates be for 1983? 1990? 2000? What will affect the rates?

(limits) - How high a limit can an airline carry on hull? On liability? What are the premium values?

- Etc., etc., etc.

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end Exhibit I

The general questions asked in Exhibit I couldn't always be answered satisfactorily. In fact, many of my questions just drew blank stares. Nonetheless, these general questions led to the following more specific question areas on the airline insurance industry.

Therefore, I concluded that a study attempting to forecast the airline insurance market would provide answers to a wide range of questions touching upon such areas such as: (1) Capacity/limits (where capacity can be defined as the largest amount of insurance or reinsurance available from a company or the market in general and limits as an amount at least equal to the loss which an insured may incur in liabilities [i.e., as the result of the destruction of a fully loaded aircraft]), (2) insurance centers, (3) facultative vs. treaty underwriting (where facultative means reinsurance of individual risks by offer and acceptance wherein the reinsurer obtains the "faculty" to accept or reject each risk offered by the reinsuring company vs. treaty which means there is no "faculty" to accept or reject each risk offered by the reinsurer but must accept all offered), and (4) premium rates (the pool out of which losses may be paid--the premiums are related to the degree of risk presented by the insured).

(Note: Though the following questions are listed under specific areas, they overlap greatly and contain central and related problems to the whole of insurance.)

(1) Capacity/limits: Will any international aviation convention emerge that will put a ceiling to liability limits? How will the need for increased limits affect capacity? What capacity will there be a need for by the year 2000? Will the current situation of a buyers' market prevail? This buyers' market was created to a certain extent by a large number of entrants attracted by the prestige and past profitability of aviation insurance/reinsurance in the mid-70s. How long can these relative newcomers stay profitably in the market? Will some large professional insurers/reinsurers with sophisticated analytical means use their selective underwriting to get off certain risks they deem unattractive? How soon will these and other factors combined exert the necessary upwards pressure on the premium rates? Or affect changes in market structure? Etc?

(2) Insurance centers: Will one center continue to set the rates by the year 2000? In other words, will London still predominate or be replaced by a fractionated market? Etc?

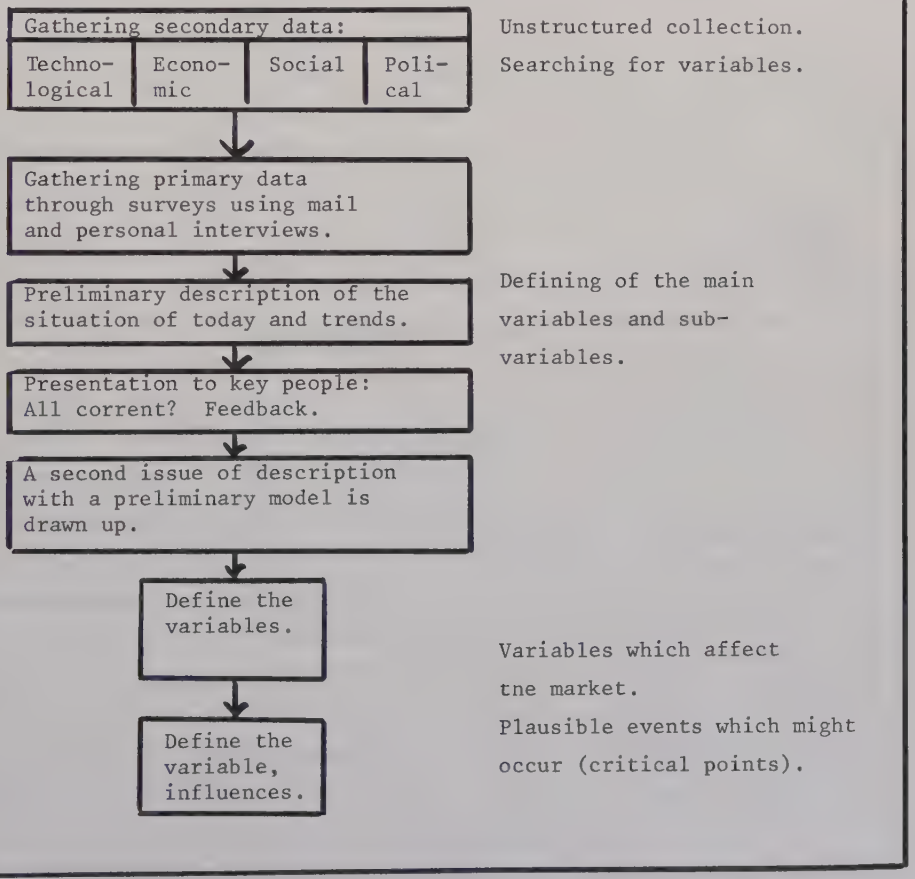
(3) Facultative vs. treaty underwriting: Will the current trend toward facultative underwriting continue or even increase? Will increased faculta-

tive underwriting provide a greater professional expertise which will provide a sounder rating technique, subject to less competitive pressure? Etc?

(4) Premium rates: Will there be a market rate set by competitive forces or will there be a realistic risk rate? Furthermore, will the premium rates have a sound theoretical basis with a sufficient safety margin to allow for a build-up of catastrophe reserves? Etc?

These areas were selected from a synthesis of problem areas in early discussions with key decision makers in the industry as the most frequently reoccurring and the insurers were usually able to respond to them in some way or another. Other areas could have been included but my hypothesis was that problems in these areas were really symptoms of broader deficiencies in decision making and planning. Therefore, these four areas became the focus of my study.

Figure 14. Research plan: Airline insurance industry.


Gathering secondary data:
Techno-logical
Econo-mic
Social
Poli-cal
Unstructured collection.
Searching for variables.
Gathering primary data through surveys using mail and personal interviews.
Preliminary description of the situation of today and trends.
Defining of the main variables and sub-variables.
Presentation to key people: All corrent? Feedback.
A second issue of description with a preliminary model is drawn up.
Define the variables.
Define the variable, influences.
Variables which affect tne market.
Plausible events which might occur (critical points).

Input from this first stage of the study and the innumerable questions was to clearly identify the problems the study would focus on in the industry and as input to the structuring of the research proposal (see Appendix I). The environmental variables and affected problem areas follow from my reading on the industry and from synthesizing the notes I took from interviews at these general discussions.

The plan for finding variables to eventually build scenarios from was shown in Figure 14.

All future contacts within the industry stem from these discussions or from contacts resulting from these first discussions. These gave me the possibility of rejecting various hypotheses presented or testing others in the several rounds that I made to the industry which will be discussed in the "gathering of data" section of this chapter in greater detail.

5.2 Choice of forecasting model.

Figure 15 shows the coarse forecasting model (map) that I used for this study.

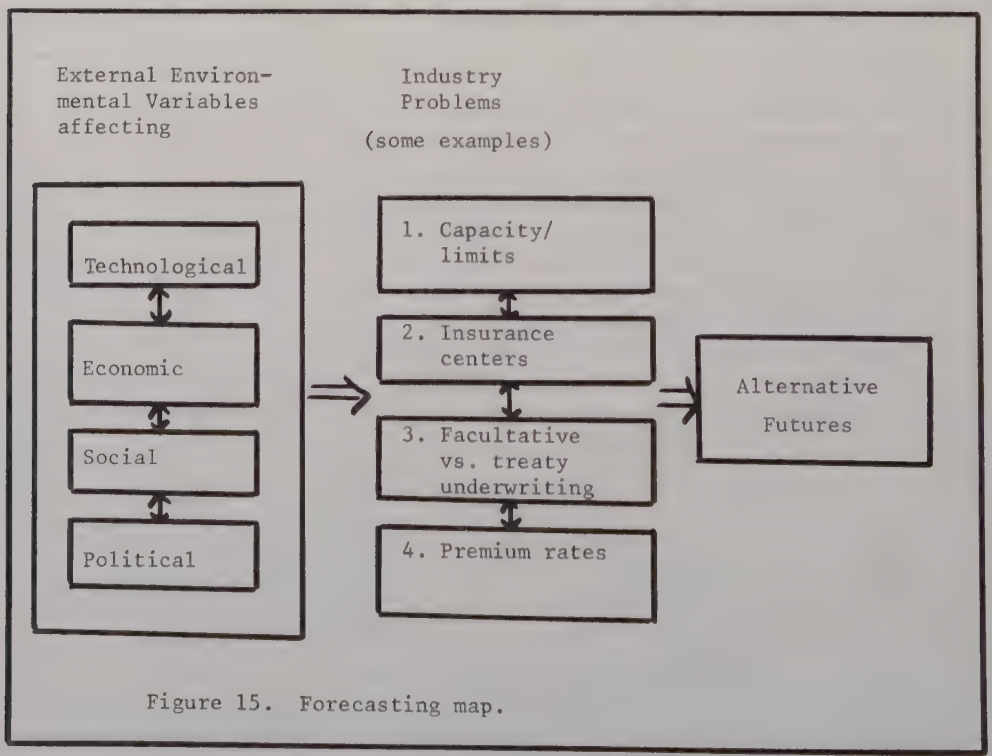


Figure 15. Forecasting map.

Each forecast is built upon the performance of a model showing which factors influence/decide the value of the forecast variable in question. These can be quantitative or qualitative models formulated in prose or mathematical terms.

The problem in doing a good forecast is to choose a forecasting model and, secondly, to choose a method of obtaining data and then fitting the data into the model.

The model in Figure 15 is a very crude model. It doesn't attempt to give a detailed picture of which different influences there are questions about (positive or negative) or how strong they are. All variables are posted for multiple influences--some will influence in one-direction, others in another direction.

This model is structured after typical models used in technological assessment (see Linstone, 1978, or Hetman, 1973). Table 6 on the next page gives an example of this.

A comment could be made at this point about my initial ideas of supporting my intuitive way of working with an analysis of hard data but this proved impossible due to lack of data to work with. Also, I investigated the possibility of building more heavily on theoretical considerations such as briefly presented in Chapter 2 but that then I would run the risk of concentrating too much on some aspects which might not be all that important in the real world. I wanted to get a holistic picture.

My over-simplified forecasting model has been applied to all variables mainly to show relationships. A more detailed model would be too complex and too difficult to handle. Because of this, large parts of the model take the form of a "black box". The real forecast process is of an intuitive nature, which is usual in such situations (Wikström, 1973, p. 48).

Jantsch divides all the various forecasting techniques into two broad types: Exploratory (which my model is) and normative. Exploratory or projective forecasting as I have stated in Chapter 4 starts from today and the present knowledge and explores future feasibilities and possibilities. Normative forecasting sets future goals and attempts to work out means for attaining them. de Houghton states (1971, p. 30), "Jantsch's work has been concerned with scientific and technological forecasting and he is very wary of the extension of these techniques into less quantifiable areas." Still, I think they can be used quite well for a study such as mine. Besides, Widman, 1980; and Kahn, et. al., 1977, use a similar approach (even if not as clearly defined and presented as I am attempting to do in this work of mine)

and have been successful in so doing. What's good enough for them is good enough for me.

Table 6. Conceptual starting point of technology assessments.

I. Technology
   a) Functional capability
   b) System of interrelated innovations
   c) Process of advance of a technology
   d) Transfer of technology
   e) Legal and social modes of introduction of a technology
   f) Importance and scale of diffusion
   g) Legal constraints and standards

II. Economy
   a) Forces generating technological developments
   b) Economic structure
   c) Size and distribution of enterprises
   d) Comparative environment

III. Society
   a) Social sub-systems
   b) Allocative pattern
   c) Social relationships

IV. Individual
   a) Health
   b) Work experience and social status
   c) Cultural and educational experience
   d) Quality of life
   e) Quality of social commitment

V. Environment
   a) Environment resources
   b) Ecosystems
   c) Effects of environmental pollution on human health
   d) Man-made environments

VI. Values and social aspects of decision-making
   a) Visibility
   b) Vested interests in existing technologies
   c) Proponents and opponents
   d) Third parties affected by the decision
   e) Government responsibility

Source: Hetman, 1973, p. 82.

The next step in the forecasting process has been to choose methods to get data and to put it into the overall model on the different variables. This is discussed in the next section.

5.3 Gathering of data.

My problem has been to develop a scheme to do this future study with. There is no single method for carrying out a future study. A future study requires an approriate mix of methods and techniques drawn from a variety of fields and much of the important work of the researcher is creative and cannot be programmed.

I chose a modified Delphi technique (modified in the sense of face-to-face iterative interviews vs. written questionnaires and also in the sense that I didn't always come back to the same representatives of the industry but tried to do so when possible; see Section 4.3 of the last chapter under "Delphi", too) for data collection as I wanted to go back to the key decision makers in the various centers in several rounds:

- To identify the problems (current).
- To check the problem areas (current).
- To identify affecting variables (current).
- To recheck problem areas and affecting variables (current).
- To follow through the problem areas and affecting variables to 1990 and 2000 (future).

That I wasn't always able to keep all of the decison makers for each of my four rounds (due to geography, lack of interest in my study, lack of knowledge about what I was asking them, time constraints, etc.) is important to mention. As an "expert" dropped out I would replace that person or go after someone who knew the specific areas I was trying to build upon for the next round. The more "into the future" I went into my study, the harder it was to get original interviewees to participate which also contributed to the lack of material to work with after 1978. Still, I did what I could.

Why did I choose this approach?

The Delphi method of qualitative forecasting can be described as a panel of experts interrogated by a sequence of questionnaires in which responses to one questionnaire are used to produce the next questionnaire. Any set of information available to some experts and not others is thus passed on to the others, enabling all the experts to have access to all the information for forecasting. A coordinator is necessary to issue the sequence of questionnaires, to edit and consolidate the responses.

Anyway, whatever technique is chosen must be viewed as a two-way com-

munication system rather than a device to produce a concensus, as traditional Delphi is usually accused of doing. The current thinking about Delphi is to get a range of opinions which is another reason why I have selected this method plus the desire for a continuous two-way communication during which I could feed back results to industry representatives. Other than not using written questionnaires in all the rounds, my study's "modified Delphi" could be just another name for the modern use of Delphi as was discussed in depth in Chapter 4.

My having face-to-face interviews rather than written questionnaires was due to the broad base of information I was seeking. I also couldn't ask all questions to all people due to their lack of information. This also allowed me to build up knowledge sequentially as a learning basis, to know what the ideas and thinking of the industry was, and to get new ideas. As there were not that many interviewees (to be discussed further on) and all weren't interested in the whole area nor would they fill in written questions, questionnaires seemed a very poor choice. Time and being just plain efficient also ruled them out.

My decision to have face-to-face interviews also stems from my desire to facilitate communication. By my taking notes (and then incorporating the responses into my developing pictures) and letting the interviewees give their thinking--sometimes with my prodding them and sometimes not--my goal was to get a wider range of responses than what one would put down with pen and ink on paper. Besides, I think it's very limiting, especially in the beginning stages to ask all the questions--the interviewees can be less inhibited with less structure. And a written questionnaire might have left off areas that would be less likely to show up in a rather formal structure.

Linstone (1975, pp. 573-586) states that there are eight basic pitfalls to the Delphi method: (1) Discounting the future, (2) the prediction urge, (3) the simplification urge, (4) illusory expertise of the "experts", (5) sloppy execution, (6) optimism/pessimism bias, (7) oversell, and (8) deception.

Most people have only a very short planning horizon and usually concern themselves only with the right now. Occurrances which appear to be far removed from the present are discounted as not having much importance. Fear of the unknown generates resistance to change--anything that endangers one's individual or group status also generates fear.

Decision making becomes more difficult as uncertainty grows. Alternatives increase and no one knows what to do with them. The possibility of

accidents or irrational events occurs. A forecast is more affected by a recent event than something in the far past. An individual's time perception distorts his own time perception data base as he tries to make "intuitive" feels about the future.

Delphi usually utilizes a panel of experts--specialists are not necessarily the best forecasters. Specialists focus on a sub-system and usually do not know what's going on in the whole. One individual--a non-conformist --may have better insight as to what might happen than a whole group of experts who all agree with each other (a very major weakness in my opinion of presenting in various rounds the sum of the conclusions from the previous one to the next which traditional users of this technique have done).

But by avoiding typical Delphi rounds of questionnaires, I've tried to allow for the "lone ranger". This is important. In Delphi later theories, "lone rangers" give more interesting results than the median answer. (See Chapter 3's coded "consequences to the industry"--the more interesting comments almost always have a "[3]" [single or minority opinion] by them.)

Poor interaction between the interviewer and the respondent makes the respondent think that he is being "polled" or "used" to educate the interviewer. Answers are hastily given without adequate thought. It is very difficult to be creative and break away from one's own prejudiced experiences.

Delphi can't be used for everything. Anonymity may be a disadvantage--in some circles the "source" of a substance might be more important than the substance of the statement itself. Credibility may hinge on the identity of the respondent rather than the response. Another reason for incorporating a coding system into the back-up for my scenarios in Chapter 3.

One will never have complete objectivity. There will always be some bias--experts are not immune from this. I didn't want to bias any more than necessary the interviewees' perceptions and interpretations with too much structure. I went to the industry to see what they think--not to project my own thinking! Whether one event happens the way I say it will doesn't really matter--my goal was to come up with a way of looking at all the variables affecting the industry--to get the industry to think of itself as a whole and the variables affecting it. Somewhere along the way, my interviewees--my experts--started seeing me as an expert because my point of vision was becoming bigger than theirs in seeing the whole industry--even if I did not have details on specific parts. Seldom did they.

Data collecting and what I did with the data, consisted of four stages

(or rounds to use Delphi terminology):

Stage 1: By a series of preliminary interviews to key decision makers in aviation insurance and the airline industries in various insurance centers of the world, it was possible to find out what factors or variables are affecting each of the four selected areas of this study--namely, (1) capacity/limits, (2) insurance centers, (3) facultative vs. treaty underwriting, and (4) premium rates.

These interviews were informal and unstructured. The goal of this first preliminary stage was to identify current problem areas (as was discussed in Section 5.1, previously). The responses were then partially analyzed intuitively to see what picture was developing in preparation for the second stage.

Stage 2: After the preliminary interviews the model was speified from the defined central variables (as was discussed in Section 5.2). It was then possible to begin to feed in data to this model by more structured interviews. Seminars were planned and held within the department for additional structurral and methodological input.

The working model throughout this study was the building up of a concise picture of the current problems in the industry to have a base to build a future picture from. Input was what the key decision makers told me with respect to the questions I directed to them. The interviews built upon one another. The goal of this stage was to check problem areas and to identify affecting variables (current). The output was changed responses to early interview synthesis, identification of affecting variables and new areas.

Stage 3: This updated "new" picture was then rechecked by interviews to further refine the developing picture. This led to the final format for the analysis of the current scenario through feedback from the industry, my own thinking, etc. This was the basis for beginning to look at the future.

Stage 4: This stage was only partially carried out as funding prohibited me from returning to many of my interviewees to check the future pictures I was developing. Difficulty in their responding to the future also curbed their interest--even those that I still had access too. I dropped my initial plans for creating scenarios for the year 2000 as it was difficult enough for my interviewees to respond and give any kind of feedback to the year 1990.

I do not wish to be hard on my interviewees. It's just that the industry (and maybe more than other industries) operates on a day-to-day basis and does not think in terms of whole pictures about itself. Nor do most of

my experts think about anything but their own areas of expertise. It's not possible to create movies with a few isolated snap shots. And to create almost entirely from the researcher's imagination and analysis did not seem meaningful.

Potential interviewees were identified from early discussions with the industry (Stage 1). The selection of people to interview was done in an arbitrary manner and upon the recommendations of a few initial (very highly placed) contacts in various markets within the industry. In practice this is a reasonable way to go.

An initial mailing was made on October 1 of 1978 to introduce my study to key personnel in the industry (see Appendix I for letter and proposal sent). Another purpose of the mailing other than to introduce myself, was to identify those in the industry willing to partake in this study over the course of coming months to supply information and give on-going feedback to my observations and conclusions in the various rounds. New interviewees were added for future rounds as others dropped out or were deleted.

I should say something about how many persons were interviewed in the various centers (i.e., Stockholm, London, New York, etc.) as this could be useful to some readers. Interviewees come from the airline insurance companies or departments of general insurance companies, airline insurance managers, and insurance specialists (i.e., legal economic, statistical, etc.).

Stage 1 (preliminary study stage) had eight major interviewees that I could work with and went back and forth in person or on the phone to them. They were broken down as follows: Stockholm (3), Paris (2), London (2),and Zurich (1).

Stage 2 had nineteen major interviewees to work back and forth with either in person or over the phone to follow up some detail. They were broken down as follows: Stockholm (9), Paris (2), London (4), Zurich (1), Munich (2), and New York (1).

Stage 3 had twenty major interviewees again to work back and forth with either in person and/or follow-up discussion over the phone. They were broken down as follows: Stockholm (7), London (9), Zurich (1), and New York (1).

Stage 4 really needed more funding to make a complete round of all the centers and as mentioned previously was only partially carried out. Lack of ability to respond on the "future" also made this a very difficult stage for me to get the interviewees to want to respond to. Nonetheless, some of

my faithfuls in the various centers did what they could. This stage, therefore, only had seven major interviews broken down into Stockholm (4), London (2), and Zurich (1).

A more scientific method of selecting my key people could have been used rather than going to the industry and finding out who were the players --then going out and contacting a representative number in each center and sub-industry (i.e., airlines manufacturers, insurance companies, etc.), and finally accepting those willing to work with me (for whatever secret or not motive they might have had as discussed previously).

As most of the information for this study has been gathered through interviews, a risk for bias from my side and from the respondents' sides has to be considered. This follows what I have already said. These biases may occur in the following areas:

(1) Translating data objectives: I may have been influenced by my previous findings (i.e., that I would rather see another insurance market center or decentralization of such than London or that the subjective answers given to me might tempt me to lay less importance to those that say London will continue as an insurance center, etc.).

(2) Measurability of the data collected: When the answers to questions are just opinions and attitudes of key persons in the industry, how can all the different answers be interpreted? What about all the subjective words that very quickly creep in--"soon", "satisfactory", "sufficient", "realistic", etc.? Ideally, the questionnaire should have been supplied with the answers! Hence the scenarios.

(3) State of the respondent: The respondent may be influenced by many factors--educational level, prejudices and moral standards, regional behavior, occupational behavior, etc. How have I considered these? Also, what about the time that the respondents were able to grant me and their intentions for ganting me this amount of time? What about the respondents that have been able to grant me a large percentage of their time compared to others--have these set a stronger personal influence in my scenarios than the ones available for only a short period and no possible return visit or even those that kicked me out? Sure, I've thought about all these things. My own lack of vested interest in the industry kept me pretty objective-- also, I selected the industry with my eyes wide open. Knowing there would be problems, knowing that I wasn't trusted (i.e., accused of seeking industry intelligence).

5.4 Analysis of data collected.

How to structure the background material of the problem area being looked at is the basic problem of future studies. Future studies are not primarily to predict developments, but instead aim or focus on how developments will be under different possible futures. I am looking at whole pictures in this study and am attempting to forecast a few specific factors even though I focused on four areas to aid the interviewees in talking about their industry.

As it is not possible to find out everything about everything, I decided to concentrate on the four major areas of interst to the airline insurers:

- Current over-capacity and set limits.
- Changes in established insurance centers to a fragmented market.
- Changes in emphasis on underwriting methods.
- What was affecting the current premium rates.

There were many reasons behind the decision to focus on these areas: (1) My analysis of the problems existing in the insurance industry generally and initial interviews with airline insurers confirmed my opinion that these areas were broad enough to include most of the current trends in the industry; (2) the airline insurers could discuss these areas and were very keen to know what were some of the causes behind the current conditions; and (3) these areas would not disappear over time in the industry as they were too basic to its operation so could be the focal point for the future.

Figure 16 shows the question/answer framework that I used to provide answers to the study from the responses from the interviews, my own thinking, reading the literature, and drawing some conclusions from possible theoretical sources (see Section 2.4, Chapter 2) such as industrial economics. Scenarios can be used to get a feel of what might happen in certain areas, for instance. By structuring my information according to Figure 16 and going through the thought processes presented in Chapter 2, Table 1, I was able to analyze my data for pictures to build futures with.

Not to repeat myself too many times--the gathering of data (information) and the analysis of it was not a static process but an ongoing one. I evaluated and restructured the interview information and recontacted key people for additional feedback, detailed questions, and continued problem definition and variable selecting.

Industry Problem Areas		Capacity/ limits			Insurance centers			Methods of underwriting			Premium rates		
Alternatives (P=positive and N=negative)		1978	1990		1978	1990		1978	1990		1978	1990	
			P	N		P	N		P	N		P	N
VARIABLES	Technological												
	Economic												
	Social												
	Political												

Figure 16. Question/answer framework for this study.

Some answers: It is difficult to handle qualitative data--even more so with unstructured interviews. Everything that is said cannot be accounted for (but then I'm only looking for trends and variables anyway). Ideally, criteria should be developed for the classification, analyzation, and interpretation of these data to reduce the subjectivity. Ideally, also, I should have clearly defined what the parameters would be for the selection of respondents (unconsciously I did have parameters but they were pretty vague--mainly just key decision makers from the various markets). Choices should be more methodologically chosen. I know that a few companies should not have been used so much--due to geography and personal contacts--but this ended up working for me. As I got to know them better and as they travel all over the world, they would make contacts for me. The real world can't be treated as a chemistry experiment.

To systematically tell how I analyzed my data would be rather fake. As I mentioned in Section 5.3 of this chapter, I went back to the interviewees in several rounds (as seen in Chapter 1, Figure 2):

- To identify current problems (the responses plus my own thinking and reading on the industry were "put together" for the next round).

- To recheck the current problem areas and to identify current

affecting variables (the responses plus my own thinking and reading on the industry were "put together" with the original analyzed responses for the third round).

- To recheck current problem areas and affecting variables (the the responses were again "put together" with prior information and from readings on the industry, etc., for a fourth round).

- To follow through the problem areas and affecting variables to 1990 and 2000 (future).

The "putting together" phase built upon each round and was an ongoing learning process centering around my model (Figure 15).

5.5 Transferring data into scenarios.

This study was developed along similar lines of previous future studies. Hedlund (1976) focused on interviews with persons in key positions in trade unions, governments, and multi-national firms, who can respond and did respond to scenarios of various kinds of worlds. Widman (1980) and Kahn, et. al. (1977) looked at environmental factors, among others, over time and their changes. Hall (1977) looked at problems and their outcomes. Beckwith (1967) used a combination of statistical and verbal data on continuing past trends and projected them into the future. He also used the differences of opinions of experts in the areas he was looking at.

The usual process of writing scenarios is to start with a few factors upon which new ones develop. But there is no one way to do this. Certain questions need to be answered: How many scenarios should I have? How well structured should they be? Should they be very systematic so that they are easier to grasp? Or rather open so that they can be used to generate many new ideas from? Should one try to give a concensus of opinions, the most typical opinions, divergent opinions, etc.? How does one even decide about these decision that need to be made?

I chose presenting the two main pictures that seemed to be developing. This is what has been done by most--Widman (1980); Wikström (1973); Kahn, et. al. (1977); Hall (1977); etc. There really isn't any set way of though of doing this--it is part of the creative process of presenting the results of a future study--the scenarios and how they will be used will also determine how they will be presented. As I see mine merely as an aid to decision makers in getting them to think about the future, they can be most closely

elated to a map or a guide. Wikström saw her scenarios in the same light. I might add that it was not Widman's original intention or explicit goal, that his scenarios be used as an aid to planning. He made this conclusion after they were created. This decision could have affected how he presented his scenarios.

Scenarios are usually built on or performed in an explicit-time frame--a time model is used to develop knowledge (i.e., 1978, 1990, 2000). They are affected by outside information (exogenous developments) and by information within the scenario (endogenous developments). This is done by sketching a paradigm of explicitly structured assumptions, definitions, typologies, conjectures, analyses, and questions and then constructing a number of explicitly "alternative futures" which might come into being under stated conditions--an explication of possibilities.

As scenarios are alternative descriptions of what situations might look like in the future, they cannot give all of the details and dynamics possible so they stress certain points of view (even if selected arbitrarily) of whole pictures (for instance) vs. the development of a few individual factors. The emphasis is not on exact predictions of what might be but as a guide post to the future.

Chapter 2 described the conditions underlying the performance of the general insurance industry today and also the airline insurance sector. Section 2.4 presented a brief theoretical analysis of some of the current conditions in the industry to gain further insight into what was happening in the industry today as a base for future happenings.

The results of this study (Chapter 3) presented a hypothetical sequence of events based on these current conditions.

Chapter 3, Table 5 presented my thinking steps for the presentation of the scenarios. (The reader should keep in mind the ENVIRONMENT ["listing of variables and general assumptions"] plus INDUSTRY RESULTS ["listing of consequences to the industry"] equals ALTERNATIVE FUTURES: 1990(a)--is an optimistic 1990 assuming available resources and continued economic growth. [It largely stems from the current picture.] 1990(b)--is a pessimistic 1990 assuming limited resources and curbed economic growth.

Information condensed from my question/answer framwwork (Figure 16) as analyzed from the data collected, my own thinking, the literature, and input from other markets (see Section 2.4 in particular) are presented as my "consequences to the industry" presented in Chapter 3.

Having presented what I did, why I did it, and how I did it, Chapter 6 will summarize this process and the study.

6. Summary and Conclusions of the Study

6.1 General comments and conclusions.

This study has tried to answer a question: "Do future studies work?" It, therefore, puts a heavy demand on knowledge of future studies' methods and that is why I have presented a virtual textbook for the reader in Chapter 4 on future studies. The insurance industry study is used only for testing and demonstration purposes and it should be viewed as an exploratory methodological study. This test--the airline insurance industry study--makes it important to generate at least some ideas about possible futures that could be of interest to people in the industry.

Ignoring the fact that answering the question "Do future studies work?" is probably a hopeless task, I assumed that future studies do work and, therefore could be applied to any industry seeking information about the future. My study is a way of using existing methods (individually and in combination, as is usually the case) and structuring to be able to come to grips with alternative change points and/or factors leading up to them over time. These change points can be used as an aid to decision makers in their planning efforts in a complex changing environment. Future studies methods should be applicable to any industry. This study was set up to prove this. If it does work for any industry, why not try insurance as an example.

Any method should be evaluated in relation to the alternatives at hand. There are at least some alternatives to doing a future study: (1) Doing nothing at all (i.e., not looking ahead). (2) Plain intuition by decision makers whereas a future study combines data and intuition in a systematic way. (3) Drawing trends for individual variables rather than presenting whole pictures, as I have done. As there seems to be no very good alternatives to doing a future study, the demands on a future study should be fairly modest.

There is no hard-formula as to what comprises a future study. I have, therefore, tried to follow similar procedures as others have done.

My results are presented in my two scenarios (Sections 3.5 and 3.6). "Do future studies work on the insurance industry?" The answer as seen by this report can be summarized as (1) partly no, due to the fact that I was not able to get (at least, to my satisfaction) adequate material about the future or even to get the industry to think about the future which leads to a second answer--(2) partly yes, because this discovery of lack of planning and future oriented thinking in the insurance industry is a positive result that the industry can use to find a remedy for. But this is only a very general sort of conclusion and result.

I made an attempt that was partly successful as my scenarios give a holistic view of the industry. Either of the scenarios could be used as a starting point for discussions. My attempt was also partly disappointing as I had hoped for a better basis for the scenarios. The results are not necessarily a failure but they do not give the rigorous basis for further analysis I was initially seeking, nor was the industry willing or able to discuss in depth the questions I raised about each of the points the industry was presenting to me. That I was often asking very specific industry-related questions was very poorly responded to if at all.

To what extent could the results have been better with alternative procedures? Though my main interest is in what I call future studies, I should look at this study from a wider set of methods. That set of methods goes from trend forecasts (really more or less complicated analytical forecasting models for some of the central variables), on the one hand, to somehow accomplished total pictures in a form of alternative future scenarios as I have done. There is no single method that is best for making studies of possible futures of an individual industry.

Some alternatives are: (1) A person could be an expert on the industry before hand, whereas, I purposely went to the industry "cold". (2) The researcher could learn about the industry from specific sources on the industry. Basically this is what I did. But I went to the industry to find out just what were those basic sources that they were using and looking at and how they trained new people, etc. (3) The researcher could build a theoretical model on the industry and go from there. (4) Or the researcher could make use of analyses vs. subjective judgments that at least look more objective.

My opinion with respect to (4) just mentioned is that, of course, all kinds of forecasting contains subjective and creative moments which are more or less important. In scenario writing they are much more important than other methods. But in such scenario writing there are still other

kinds of methods that can be used (singly or in combination) like trend forecasting or theoretical models for some specific variable, economic analysis and so on.

Most forecasts also build on/contain some kind of hypothetical statements or assumptions which are to be judged by the reader or user of the forecast. If the reader accepts that assumption, the results of the forecast could be used as it is. If the reader wants to change that assumption, the results also have to be changed.

Some of my items in the scenarios are of that nature. The main thing though is the role of such theoretical statements, assumptions and special forecasts in the process of making a more subjectively based scenario of the future or a future study.

In my study I have been trying to base much of my scenarios on explicit statements by the people in the business. I thought, at the beginning, more or less, that I could get a good starting point of the future but knew that I'd have to rework it. And that I could also ask rather direct questions about what would come in the future. Nor did I feel I needed to give the interviewees very much help in thinking about the future as I didn't want to bias or prejudice their comments. I only gave a kind of structure for my questioning, asking questions in various areas, basing the questions on my previous attempts to describe various events in the business.

I got some answers but they weren't enough for a thorough starting point. And they shouldn't be enough! So I supplemented this with other comments from my theoretical analysis and literature search, and so on, which, of course, should always be done. I had expected more than I really got. This might be explained in alternative ways: (1) That it is impossible to make future studies of individual industries based on some kind of interviewing of people only in the industry. (2) That I gave the interviewees too little help in thinking and talking about the future is another possibility which I believe more in though. (3) Another possibility might be that they didn't want to give me the information (though I don't believe so much in that possibility).

If it so that I gave the interviewees too little help, I could give more help to them in a new similar situation. With that I mean, the possibility of presenting more information to the interviewees or even ready made alternatives to the people in the business to give opinions about. For instance, when I talk about the general conditions and changes in society which are not inside the insurance industry but are of importance for the

development of the insurance industry--I could have to a much larger extent gotten information about that through use of sources outside of the industry or by interviewing other people (i.e., economic experts and so on) outside of the industry. I could also have used general future studies made by others and different kinds of published materials, etc. More reliance could have been made on theoretical analysis, the kind of work which I presented in Section 2.4 of this report to find out what are crucial factors that affect, for instance, the kind of price leadership or the kind of fluctuations that will take place in the industry. I could then have asked what the interviewees thought about changes in reactions to the lags about changes in risk levels and so on or in accidents that occur, etc. "What do they think about buyer behavior?" is another example. Though I did initially ask questions on this level (see Exhibit I in Chapter 5), I found I could not get satisfactory answers so I asked questions that the insurers could talk about as mentioned several times in this report. The aim of these general questions was to open up the field for much more specific questions that could be much more easily answered by the industry.

One problem behind this is that the researcher needs to know a great deal about the industry--very much apparently to be able to make a good future study. Maybe one of the differences in the study made by Widman (1980) and Wikström (1973) and my own study is that they did their studies on problems and industries on which they knew a lot in advance. I started from scratch on purpose but tried to get information from the industry and use it to build my future study almost only with the information I had obtained from the industry.

Maybe that's the wrong way to go about doing it. On the other hand, I have to say that insiders are probably not the persons to do future studies of their own industry. But there has to be some sort of optimum combination of inside knowledge and outside creativity for making a good future study. I could certainly have asked very precise questions and therefore could have gotten more out of the interviews but would have missed other information. This could have been countered though with the gaining of more knowledge and allowed me to contribute more theoretical developments. But this could have steered me away from creativity.

As stated in Chapter 4 of this study, there really are no criteria for evaluating a future study. One way of evaluating a future study method is to look at the results and their usefulness. Whether the decision maker wishes to include the results in his planning horizons will depend on his

own objectives.

The significance of this study has to be looked at from the perspective of how it is to be used. It can be used as a planning tool or as a device to show that very little future planning is being done in the industry. It allows decision makers to make their own decisions about what can be done to prevent or alter current trends that could have disastrous effects down the road into the future. It can also serve, at least, to make decision makers aware even if changes cannot be made.

There could be additional work in the insurance industry based on the approach of this study--marine insurance, the shipping industry, banking, fashion, etc., to even name some other industries that are in troubled current times. They are also industries having problems but usually do not open up to outsider's yet needing an outsider's point of view and lack of vested interest. Even for someone just to do an industrial study to see what is going on world-wide in one of these areas would be a contribution to knowledge in looking at the future macro-environment and it's effect on troubled global industries.

In looking at scientific criteria for evaluation, a positivistic approach doesn't get very far. There are other criteria for looking at a future study and it's main criteria is it's contribution to knowledge within the industry. By systematically looking at macro-environmental variables and their affects over time on troubled industries is a definite contribution to knowledge. That all readers can follow what I've done in this study should be the criteria for looking at the quality of this study.

My final conclusion, therefore, is that what I have done has some drawbacks and is partly disappointing as I did not get all of the information that I was seeking from the interviewees, but, nonetheless, it was a very worthwhile experience. If I started today, the main difference in my approach would be to allow more time in the final rounds and make use of more theoretical knowledge. But knowing what I know today, I would still attempt doing a future study in a field I know nothing about but would add more steps (or stages), give more aid to the respondents, especially in the final rounds, and as I mentioned--more use of theoretical knowledge. I can now give myself more credit for knowing what to do--there is only so much that one can learn from books about future studies. This must be coupled with one's own first-hand experience. Lots of time initially is needed to figure out what to do. There is lots of trial and error. But one must not get lost in the rigour--more art is needed.

So, I don't think the question to be asked is whether or not I conducted a proper future study--there really isn't any one way to do one and my "methods" fall within the range of past studies. The main weaknesses of my results stem from some of the weakness in doing future studies in general (see Chapter 4). My asking specific questions about the industry was an attempt to overcome some of these weaknesses but it had not occurred to me that the industry I had chosen would be so unable to respond to questions about the future. This is information in itself and can serve as an aid to the industry.

I might, however, round the whole study up by saying that a future study can never be perfect and that it need not be perfect. It's aim is more to stimulate thinking in the user group and not to make that thinking unnecessary by presenting a complete and ready made solution of all their problems.

And what I would like to close on are some of the areas of research for the field of future studies itself. This is briefly presented in the last section, Section 6.2.

6.2 Areas for future research.

The most important areas for future "future research" are in the areas of criteria and methods for doing a future study and how they should be evaluated? What standards should be applied?

What are the strengths and weaknesses of different forecasting techniques? How do studies which combine various approaches compare with "pure" predictions from well-defined benchmark models? What are the differences between econometric and judgmental forecasts which would be of interest to both practitioners and researchers?

The accuracy and usefulness of forecasts over a long period of time. This has been done for the short-term, but why not start analyzing longer term studies from the 1950s and 1960s and 1970s to make a comprehensive analysis of their accuracy and other properties.

Just as the role of exogenous and endogenous factors are important in looking at economic growth and fluctuations, what is the role of exogenous and endogenous factors on economic forecasting?

What's the feedback from the implementation stage of future studies?

What are the strengths and weaknesses in forecasting different variables and processes?

These are just a sample of possible topics that researchers and practitioners in the field need to address their attention to.

Appendix I

Cover letter and proposal mailed to industry,
October, 1978

DEPARTMENT OF BUSINESS ADMINISTRATION

Stockholm, 1 October 1978

Dear :

I am finishing my Ph.D. at Stockholms University's Department of Business Administration in marketing and business planning with special emphasis in future studies. My dissertation area is in methods and models for structuring complex problems with a practical case study in the airline insurance industry.

The attached proposal entitled: "A model for forecasting the behavior of the airline insurance market" is a summary of my study. I would appreciate your assistance in the following areas: (1) Your comments on the study in general; and (2) your ideas on the technological, economic, social, and political variables as they have affected and will affect airline insurance (see Figure 1 in the proposal). As this is only a preliminary discussion, I am looking more for ideas and leads to follow with as many dfferent points of view as possible.

Timing for this phase of the study is important and I would appreciate it if you could respond as soon as possible.

I shall be looking forward to hearing from you soon.

Most sincerely,

Jeannette Vavrin

Enclosure attached.

Jeannette Vavrin
Department of Business Administration
Stockholms University
1978-08-28

A model for forecasting the behavior of the airline insurance market

Introduction

Today the aviation insurance market is faced with over capacity and declining premium rates. This situation has prevailed for some time and it is difficult to predict any changes and when these changes can be expected to occur. This study attempts to identify and analyze the internal and external variables affecting the behavior of the airline insurance market currently and to make projections of the future.

This study will confine itself to the airline insurance market (including charter) but exclude general aviation, military, space, and satellites.

A study attempting to forecast the airline insurance market would provide answers to a wide range of questions touching upon areas such as: (1) Capacity/limits (where capacity can be defined as the largest amount of insurance or reinsurance available from a company or the market in general and limits as an amount at least equal to the loss which an insured may incur in liabilities [i.e., as the result of the destruction of a fully loaded aircraft]), (2) insurance centers, (3) facultative vs. treaty underwriting (where facultative means reinsurance of individual risks by offer and acceptance wherein the reinsurer obtains the "faculty" to accept or reject each risk offered by the reinsuring company vs. treaty which means there is no "faculty" to accept or reject each risk offered by the reinsurer but must accept all offered), and (4) premium rates (the pool out of which losses may be paid--the premiums are related to the degree of risk presented by the insured).

(Note: Though the following questions are listed under specific areas they overlap greatly as they contain central and related problems to the whole of insurance.)

(1) Capacity/limits.

Will any international aviation convention emerge that will put a ceiling to liability limits? How will the need for increased limits affect capacity? What capacity will there be a need for by the year 2000?

Will the current situation of a buyers' market prevail? This buyers' market was created to a certain extent by a large number of entrants attracted by the prestige and past profitability of aviation insurance/reinsurance in the mid-70s. How long can these relative newcomers stay profitable in the market? Will some large professional insurers/reinsurers with sophisticated analytical means use their selective underwriting to get off certain risks they deem unattractive? How soon will these and other factors combined exert the necessary upwards pressure on the premium rates? Or affect changes in the market structure?

(2) Insurance centers.

Will one center continue to set the rate by the year 2000? In other words, will London still predominate or be replaced by a fractionated market?

(3) Facultative vs. treaty underwriting.

Will the current trend toward facultative underwriting continue or even increase? Will increased facultative underwriting provide a greater professional expertise which will provide a sounder rating technique, subject to less competitive pressure?

(4) Premium rates.

Will there be a market rate set by competitive forces or will there be a realistic risk rate? Furthermore, will the premium rates have a sound theoretical basis with a sufficient safety margin to allow for a build-up of catastrophe reserves?

By addressing these questions and siliar ones, this study also serves as a "case study" of the airline insurance industry to test methodology for handling complex research problems.

These areas have been selected from a synthesis of problem areas in early discussions with key decision makers in the industry as the most frequently reoccurring. Other areas could have been included but my hypothesis is that problems in these areas are really symptoms of broader deficiencies in decision making and planning in the industry.

My problem is to develop a scheme to do this future study with (to find a method for gathering information); then, to ask the questions to determine to what extent the information received serves the purposes of this study and what more is needed.

Research Approach

The research approach consists of four stages:

Stage 1: By a series of preliminary interviews to key decision makers in aviation insurance and the airline industries in various insurance centers of the world, it will be possible to find out what factors or variables are affecting each of the four selected areas of this proposal--namely, (1) capacity/limits, (2) insurance centers, (3) facultative vs. treaty underwriting, and (4) premium rates.

For example, the following questions would need to be answered about capacity: What technological, economic, social, political, etc., factors will affect capacity? Who knows information about these variables? What is the available data concerning capacity? What statistics are available? What are the reasons behind these variables? What has the past experience been?

These interviews would be informal and unstructured using a modified Delphi approach with key decision makers (modified in the sense of face-to-face iterative interviews rather than written questionnaires). The goal of this first preliminary stage would be to identify current problem areas. The responses would then be analyzed intuitively and compared to secondary data and literature sources on the industry and other markets.

The framework for collecting and analyzing data is shown in Figure 1. (Note: The model in Figure 1 is structured after typical holistic models used in technological assessment--see Harold A. Linstone's The Use of Structural Modeling for Technology Assessment, Vol. 1, Portland State University, Portland, Oregon, February, 1978; or, Francois Hetman's Society and the Assessment of Technology, OECD, Paris, 1973, as examples.)

Stage 2: After the preliminary interviews the model can be specified from the defined central variables. It will then be possible to begin to feed in data to this model by more structured interviews. Seminars would be planned at this stage within the department for additional structural and methodological input.

The working model throughout this study would be the building up of a concise picture of the current problems in the industry. The base for this picture is what the key decision makers, through a modified Delphi approach, tell me with respect to the questions I direct to them. The interviews build upon one another. The goal of this stage is to check problem areas and to identify affecting variables (current). The output would be changed responses to earlier interview synthesis, identification of affecting variables and new areas. The analysis would entail a synthesis of areas and affecting variables.

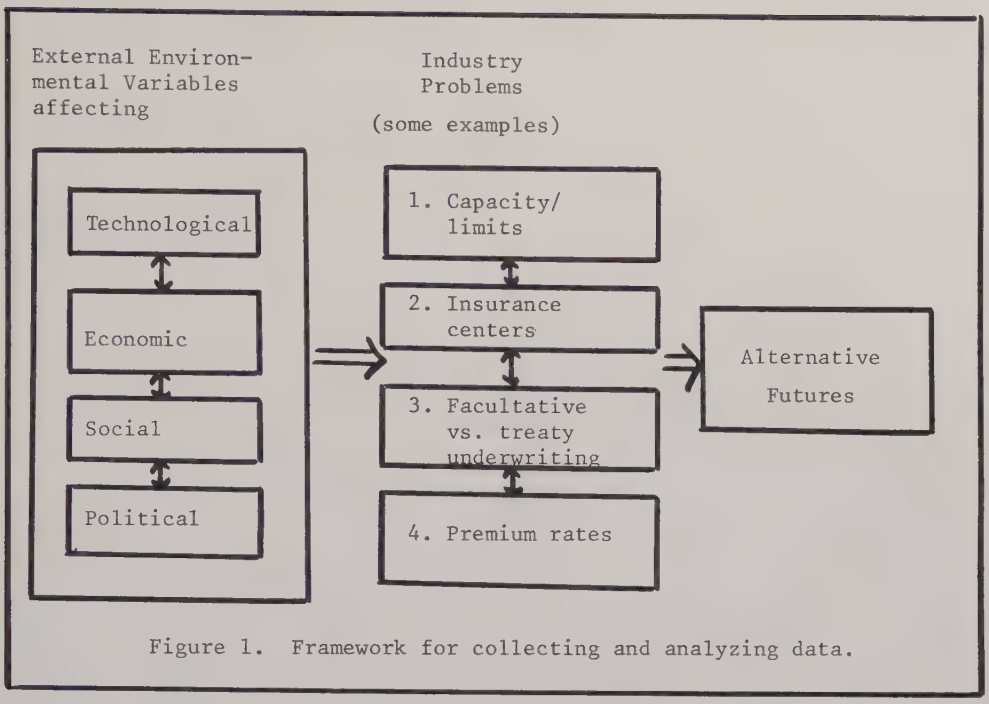


Figure 1. Framework for collecting and analyzing data.

Stage 3: This updated "new" picture would then be rechecked as to areas and affecting variables to further refine the developing pictures. This would lead to the final format for feedback from the industry, my own thinking, and as compared to other markets. This would provide the structure for identifying new areas and affecting variables over time.

Stage 4: Another round of interviews to follow through with the current picture's affecting variables and problem areas over time would also be carried out. The results of this would then be synthesized into new pictures which will be analyzed and then developed into various scenarios for the medium-term (to 1990) and for the long-term (to 2000). These scenarios will not only include how the four affected areas will turn out but also how developments in these four areas will affect the market behavior of the airline insurance industry.

Input to this study will be structured and unstructured interviews with key decision makers in the airline and insurance industries, my own thinking based upon literature on the industry and for structuring research problems, and input from other markets.

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end Appendix I

Appendix II

A glossary of insurance terms and techniques[a] pertaining to the study

Broker--a person specializing in the placing of insurance or reinsurance business. Although he is the agent of the insured or the reinsured, he is reimbursed by either the insurer or the reinsurer, by way of brokerage fee.

Capacity--the largest amount of insurance or reinsurance available from a company or the market in general.

Cede--to transfer to a reinsurer all or part of the insurance or reinsurance written by a ceding company.

Ceding company--reinsured; the insurer which ceded all or part of the insurance or reinsurance it has written to another insurer.

Co-insurance-where more than one underwriter accepts the risk and issues the policy of insurance.

Direct-insurer--the insurer who accepts the risk from the proposer and who so far as the policyholder is concerned is alone responsible for the obligation undertaken.

Facultative reinsurance--means reinsurance of individual risks by offer and acceptance wherein the reinsurer obtains the "faculty" to accept ot reject each risk offered by the reinsuring company.

Facultative treaty--a reinsurance contract under which the ceding company has the option to cede and the reinsurer has the option to accept or decline individual risks. The contract

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[a] Geared to the layman (I hope)--input is from interviews, July, 1978, to January, 1979.

merely reflects how individual facultative reinsurance shall be handled.

Hull--insurance cover for aircraft frames (i.e., hulls), its equipment, instruments and/or special acessories.

Insurance pool--(also associations, syndicates, etc.) an organization of insurers or reinsurers through which particular types of risks are underwritten with premiums, losses, and expenses shared in agreed amounts.

Liabilities--the amount of loss which an operator of an aircraft may incur to injured parties (cannot be know in advance as in hull).

Line--(i.e., of business) the general classification of business as utilized in the insurance industry (i.e., fire, life, auto, aviation, etc.)

Limits--an amount at least equal to the loss which an insured may incur in liabilities (i.e., as the result of the destruction of a fully loaded aircraft).

Original insured--i.e., the airlines.

Premium rates--the pool out of which losses may be paid; the individual amounts are related to the degree of risk presented by the insured.

Producing agent--broker.

Reinsurance--the transaction whereby the reinsurer, for a consideration (fee), agrees to insure the ceding company against all or part of the loss which the latter may sustain under the policy or policies which it has insured.

Retrocession--reinsuring the reinsurer; the transaction whereby a reinsurer cedes all or part of the reinsurance it has assumed to another reinsurer.

Treaty--(also facultative obligatory treaty) means reinsurance of individual risks by offer and acceptance wherein the reinsurer does not obtain the "faculty" to accept or reject each risk offered by the reinsurer but must accept all offered.

Underwriter--the insurer.

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end Appendix II

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